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My dear Sir,

I rejoice to dedicate the following pages to you, as it affords me the opportunity of publicly acknowledging not only the valuable instruction which I derived from your lectures on midwifery, but also the practical information, which I have continued to receive from your high professional attainments. To my obligation in these respects, allow me to add a large debt of gratitude for that unvaried friendship, which I have at all times experienced from you personally.

I only regret, that I cannot make these acknowledgments in a publication more worthy of your protection.

At the same time, I beg you will accept my sincere congratulations on your having received from our Most Gracious Sovereign your present

Hence it is, that so much improvement has been wrought in the several departments of physic, surgery, and midwifery by the efforts and observation of eminent men, whose names will adorn the page of history to the latest ages of posterity.

In country practice the case is far otherwise. It is true that in this field will be found men of the same talent and zeal, equally desirous to cultivate and improve the science to the honour of themselves and the advantage of the public: but when we consider the multifarious nature of this kind of practice, we shall perceive that it presents more objects to his attention than the practitioner can satisfactorily compass.

Here, being authorized to practise in every branch of the profession, and publicly announcing himself equal to the engagement, he is held responsible, and is expected not only to be well acquainted with the nature and treatment of every disease that may come before him, but to be prepared to meet every emergency with promptitude, judgment, and ability, whether it be to trephine the scull—to open the trachea—to release an incarcerated hernia—to tie a wounded artery—to amputate a limb—or to perform any of the anxious operations of midwifery; any of which he may have to accomplish at the shortest notice in the depth of the country, either perplexed with the anxieties of relatives, amidst the criticism of (it is to be feared frequently) an illiberal consultation, or without any consultation at all. Nevertheless, it is of the highest moment that the medical art in this extensive province, in which, probably, one half of the profession is engaged, should be exercised upon the best principles throughout all its ramifications, and that its kindly influence should be as effectually felt and acknowledged in the lowly cottage of the poor, as in the splendid mansion of the rich.

With this view, how necessary—how indispensable it is, that every student, intended for so important a situation in life, should diligently apply himself to acquire as much practical knowledge as he can during the short—too short period, usually allotted for this purpose. Should this season be inconsiderately misspent, and lavished in the enjoyment of idle and fruitless amusements, such an error will one day be fatal to his professional character, and frequently expose him to the severe mortification of being obliged to yield the credit and gratification of saving the life of a fellow-creature by a skilful operation, to another, who shall have been more attentive to his studies, and therefore more competent than himself.

The student should also be mindful not to waste his valuable time in the acquirement of novel hypothetical doctrines, which may be the fashion of the day; but to apply himself to the attainment of established principles and useful knowledge—such as shall serve him in the field, befriend him in the hour of danger and difficulty, and be a firm and broad basis, on which he can build the superstructure of an efficient experience, and an eminent reputation. "Of this knowledge," says the late Mr. John Bell, "anatomy surely forms the greatest share. Anatomy, even while it is neglected, is universally acknowledged to be the very basis of all medical skill. It is by anatomy, that the physician guesses at the seat, or causes, or consequences, of every internal disease; and without anatomy, the surgeon could not move one step in his great operations."—*Anatomy and Physiology of the Human Body.*

But practical anatomy is not to be acquired by rote, however fluently it may be repeated. The student may know the names of all the muscles, with their origin and insertion, and the names of all the processes and cavities of every bone; he may be enabled to recite consecutively the whole catalogue of arteries, veins, and nerves; describe the structure of the brain and spinal cord, with their membranes; accurately enumerate the different names of the thoracic and abdominal viscera; and argue with subtilty on the subject of physiology; and yet be far—very far, from being a practical surgeon.

This valuable qualification can be acquired only by frequent dissection and attentive observation. It is one thing to repeat the name and mention the situation of an artery that may require to be tied, and quite another to find it with the scalpel. It is in vain to know by heart the different parts connected with strangulated hernia, if he have not made himself practically acquainted with them by actual dissection.

Let me then implore the candidate for general practice, as he values the health aud life of his fellow-men, and his own reputation, not to lay aside his scalpel, till he has put himself in possession of a practical knowledge of the anatomy of the human body. Let him make himself familiar, especially with the situation and relative position of the blood-vessels, nerves, &c., of the neck, upper part of the thorax, axillæ, groins, and extremities; let him familiarize himself also with the surgical anatomy of the abdomen and pelvis; in short, with all those parts, that are most frequently involved in injuries, diseases, or any other circumstances requiring operative surgery. He should also become well acquainted with the natural situation and structure of the thoracic, abdominal, and pelvic viscera, with their nerves, blood-vessels, and functions, that he may readily detect their morbid characters, and distinguish their diseases. He will then go into the field of practice well prepared for the important duties he has to perform, and be esteemed a useful and ornamental member of society.

———— "sicut
Parvulà (nam exemplo est) magni formica laboris,
Ore trahit quodcunque potest, atque addit acervo,
Quem struit, haud ignara ac non incauta futuri."
Horatii, Sat. 1.

Having commenced his career, it will behove him, in the next place, to keep up the knowledge that he has attained. But how is this to be done? In the country, there may be no hospital or dispensary to be visited; no lectures to be attended; no scientific physician or surgeon at hand, with whom he can converse on the subject of his profession; nor will his sphere of action, at the onset, be probably sufficient for the exercise and improvement of his varied acquirements; and from these negative causes, together with the interposition of domestic occurrences, it not unfrequently happens that in the course of time, his energy becomes languid, and an unconscious forgetfulness steals over his mind, that renders him liable to be surprised and confounded by the emergencies of his profession.

In order to prevent these retrograde results, every practitioner should take up his engagement both as a duty and a science. The active co-operation of these two principles will convert every toil into a pleasure; will make him deeply interested for those, who may be placed under his care; and closely observant of the causes, character, and terminations of disease. He will be led to a more correct acquirement of pathological knowledge, by the investigation of bodies after death; during which (as often as opportunities may allow), his surgical anatomy may be renewed by cutting down upon the principal arteries: but in these laudable pursuits let him ever be mindful to conduct and finish his operations with decency and circumspection, so that there may remain no appearance or even the semblance of any needless mutilation, that may operate as an offence to the friends of the dead, and thus frustrate the ends of science.

He ought also to add to the stock of his information, by the perusal of the best medical books and periodical publications; and it is the duty of every general practitioner to keep himself always prepared to meet, as effectually as possible, the pressing calls of emergent injury and disease.

This last observation brings me to the subject of the following pages.

At the early part of my medical career, conscious of the many liabilities of my situation, I have often felt the want of a publication, that might systematically embrace the nature and treatment of all emergencies; a work—in which I could frequently exercise my mind, and which might at the same time serve as a brief and *authoritative* reference upon those occasions.

Such a desideratum I have endeavoured to provide in the following pages, partly from my own experience of more than twenty years, and partly from that of others. I have, however, confined myself *for the present* to those emergencies that may occur to the head, neck, trunk, and external parts of the body, in a surgical and obstetric point of view; and the treatment is referrible principally to the onset of the case.

It was my intention at first to publish the work in aphorisms, agreeably to the plan adopted by the late Dr. Denman, in his aphorisms on the application and use of the forceps and vestis, &c.; but as it is designed for an occasional exercise, as well as for the purpose of a reference, the present catechetical form has been preferred: and in order that it may assume a more systematic character, the various emergencies have been arranged in classes, orders, genera, &c., according to the part of the body involved.

It may be objected that there is no necessity for a work of this kind, as most of the subjects, it embraces, may be found in the general works of other authors; for example, in the comprehensive Dictionary of Mr. Cooper. To this I can satisfactorily reply, without in the least degree detracting from an author, to whose labours the profession must ever be indebted, and whom I personally respect, that such a system is manifestly intended and adapted more for profound and patient research, than for a brief and rapid sketch in the moment of emergency.

I have taken pains to put the questions to illustrate, as much as possible, the subject in hand; and in order that they may be answered with the greatest effect, the most important replies have been cited from some of the best authorities, whose names are affixed; but the brevity so indispensably necessary to a Work of this kind, has prevented me from quoting many other authors of equal respectability.

I fear that they, who may honour me with a perusal, will find much to criticise; but if the work be found to contain *practical information, and to be conducive to the objects in view*, I must throw myself on the indulgence of my readers to forgive its failings in all other respects.

Southampton, Nov. 22, 1831.

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PRACTICAL EXAMINATIONS,

&c.

Class I.—*Communia.*—Emergencies common to the external parts of the body.

Order I.—*Vulnera.* Wounds.

Genus 1.—*Vulnus incisum.* Incised wound.

What do you understand by an incised wound?

1. A simple solution of continuity, caused by the edge of a cutting instrument.

What is the treatment of an incised wound?

2. The margins of the wound should be accurately brought together by adhesive plaister, and retained in their proper place by bandage.

With what view?

3. To heal by the first intention.

Are there any circumstances to be attended to previously to this being done?

4. Hemorrhage is a circumstance of the highest importance, and ought first to be restrained.

In what manner would you restrain hemorrhage?

5. If the hemorrhage be slight, the application of cold water or pressure may suffice; but, if too profuse to be restrained by such means, the vessel from which it springs must be secured by ligature.

The hemorrhage being restrained, and the wound dressed, what remains to be done?

6. The limb or part wounded should be so placed that the contiguous muscles may be relaxed; and perfect rest must be enjoined.

Genus 2.—*Vulnus punctum.* Punctured wound.

What is the indication of cure in this kind of injury?

7. To heal, if practicable, by the first intention; if not, to prevent inflammation.

What punctured wounds will usually admit of being healed by the first intention?

8. Such as are caused by a sharp-pointed, clean-cutting blade.

What results are mostly to be apprehended from this injury?

9. Inflammation and abscess; results very common in punctured wounds that are caused even by the most favourable weapons.

How would you endeavour to prevent or subdue inflammation?

10. Should the wound be caused by an unfavourable weapon, it ought to be dressed lightly; local bleeding should be employed; cold evaporating lotions constantly applied, and the parts kept in absolute rest, and free of all tight bandaging. Moreover, should an important part be involved, general bleeding ought to be adopted, and repeated as often as inflammation may demand. It will also be necessary to administer saline purgatives with cooling medicines, and to direct a strict antiphlogistic regimen.

Should a punctured wound be complicated with a profuse hemorrhage, in what manner would you restrain it?

11. We ought first to endeavour to control the bleeding by wet compresses and bandage; but, should these means fail of success, the wound must be dilated in the direction of the muscular fibres beneath, and the vessel secured by ligature.

Suppose a part of the weapon (for example, the narrow blade of a knife,) that has inflicted a punctured wound, should be broken off, and remain deep among the muscles, would you decide on removing it, even if the attempt required the dilatation of the wound?

12. It is the duty of the surgeon to remove any extraneous body that may be fairly within his reach; but should it lie so deep as to elude detection by the finger or forceps, the best practice will be to suffer it to remain, rather than to search for it by much poking, or by speculative dilatations.*

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* The following case will illustrate this point of practice.

In the spring of last year, John Hawksworth accidentally fell upon the pen-blade of a clasp-knife, that lay half open upon the floor. It entered the anterior part of the left thigh, a little above the patella, penetrating the

Can you explain the principal reason, why abscess is so frequently the result of deep-punctured wounds?

13. It may be reasonably accounted for in this manner. If any point of the upper part of the wound unite, and some point of the lower part remain open, the secretions of such a cavity are poured out into it, and being confined there, an abscess is the result. It is on this account that adhesive plaisters and tight bandaging are so seldom admissible in the treatment of this species of injury.

tendons of the rectus femoris and cruralis muscles, and broke off deep in the wound. A surgeon immediately came to his assistance, who, having diligently endeavoured to detect the blade, wisely decided on leaving it to be disposed of by natural process, rather than to irritate a part so contiguous to the joint by any farther pokings. The external wound in a very short time healed, *without being attended by any inflammation or abscess.* But the poor man being lame and unable to work, and fearing that the blade left in the thigh might occasion serious consequences, sought farther advice, and consulted my opinion. Whilst the limb remained straight no trace of the blade could be discovered; but, on bending the leg at right angles with the thigh, the blunt end was distinctly felt considerably beneath the integuments. Rejoiced at the discovery, he was very anxious that it should be removed, to which I consented, reflecting on the proximity of the point of the blade to the capsular ligament. The operation was accordingly performed by the gentleman who first attended him, and, after some difficulty, a narrow blade, about two inches long, was skilfully extracted. The wound being lightly dressed, the patient was ordered to bed, and the knee subsequently treated by topical bleeding, cold lotions, and the antiphlogistic regimen; but, in spite of these means, inflammation and suppuration ensued to such an extent, that the matter burrowed deeply amongst the femoral muscles more than half way up the thigh, and afterwards surrounded the knee-joint, so as to resemble a distension of the capsular ligament The purulent fluid was occasionally discharged by suitable openings, which very much relieved him. At this time his general health gave way, and his recovery became doubtful: however, after having been confined to his bed many months, the abscess healed, and he recovered with a stiff limb, the rigidity of which was manifestly occasioned by an agglutination of the muscles and cellular tissue from the adhesive inflammation which had so extensively taken place.

This appears to me to be an interesting and instructive case; and, reflecting on its nature and result, I should say, that it would have been better to have left the blade in the wound, to be disposed of by the powers of the constitution, or, at least, to have waited till it had approached *much nearer* the surface, than to have disturbed it by an operation. In the second volume of the Medico-Chirurgical Transactions will be found an instance recorded by Mr. Bush, of Frome, in which the blade of a clasp-knife had remained amongst the muscles of the back for more than eleven years; and which at length causing some inflammation, was extracted. This case is cited to prove the propriety of the blade being left in the wound at the infliction of the injury, rather than the safety of ultimately taking it out.

GENUS 3.—*Vulnus contusum.* Contused wound.

What is understood by a contusion?

14. A contusion is characterised by pain, tumefaction, discoloration of the skin, and generally by an extravasation of blood, or serous fluid, into the cellular membrane; and is usually occasioned by the violent application of obtuse bodies.

What is the treatment of a contusion?

15. In slighter degrees of this injury, it will generally be sufficient to embrocate the part with the linimentum saponis compositum; or should this be impracticable, (for example, in black eyes from pugilistic combats) leeches ought to be applied, and subsequently a lotion, calculated to prevent inflammation and excite absorption. The following may suffice:—

R. Liquoris ammoniæ acetatis,
Aquæ sambuci, sing. f. ℥ iij.

In more severe contusions, will it not be necessary to adopt other measures?

16. Certainly. In all severe contusions of the head, spine, thorax, abdomen, and the larger joints, such as are occasioned by falls, blows, spent cannon-balls and the like, it will not only be necessary to embrocate the part, and topically to bleed it by leeches or the cupping-glasses, &c., but to employ venesection, purgatives, rest, and the antiphlogistic regimen.

What treatment would you adopt for extensive extravasation unattended with inflammation?

17. " In many cases, unattended with any threatening appearances of inflammation, but in which there is a good deal of blood and fluid extravasated, bandages act very beneficially, by the remarkable power which they have of exciting the action of the lymphatics, by means of the pressure which they produce."—*Cooper's Dictionary of Practical Surgery—Article,* Contusion.

What treatment would you employ for an effusion into the knee-joint from this cause?

18. Blood should first be drawn locally by cupping or an adequate number of leeches; after which, wet compresses and a bandage may be applied, taking care to order the bandage to be slackened, if it produce pain.

Are there any characteristic marks to indicate whether the vitality of the part has been destroyed or endangered by a contusion?

19. There are, perhaps, no peculiar marks that will enable us to decide immediately upon the infliction of the injury. If the vitality of the part is not entirely destroyed it will soon be relieved by the means above-mentioned; "but where that is the case, a circumscribed tumor, soft and pulpy to the feel, forms on the spot: the skin, at first of a natural colour, gradually assumes a dusky shining hue, and either sloughs off, leaving beneath a dark, glossy, flabby, muscular mass, discharging a tenacious, bloody sanies, or else a chain of ill-conditioned abscesses form, which soon run into one another, and burrow deep beneath the disorganised mass of skin and muscle, if not prevented by timely evacuation."—*Hennen's Principles of Military Surgery.*

If there be good reason to believe that the vitality is greatly endangered, and should there be proof of extensive extravasation or effusion, what ought to be done?

20. "There are two points to be most particularly attended to in these cases: first, the external application used as a discutient should neither be purely sedative nor powerfully exciting, but of a mild stimulant nature; otherwise the whole surrounding parts will be overspread by an erysipelatous inflammation, and their vitality will be destroyed. Secondly, when the effusion of blood or formation of matter is clearly ascertained, it should be removed with the strictest attention to the rules of art, particularly as they regard smallness of aperture and cautious exposure to the air; otherwise an accident, easily remedied by proper treatment in the beginning, may ultimately prove fatal."—*Ibid.*

Might not a serious injury of the subjacent or internal parts be produced by violent contusion, without its having made any external appearances?

21. "It very often happens that while all is smooth and sound to the eye, or there is, perhaps, only a slight erosion of the skin, a very serious injury has been done to the subjacent parts."*—*Ibid.*

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* *Case.*—A lad, about 14 years of age, who was driving a waggon laden with poles, fell under the wheels (so it was supposed), and was found dead on the road. An inquest was held; and though no one had witnessed the accident, and *no external marks whatever* were visible on the body, the jury found a verdict of accidental death. But some charitable neighbours having insinuated that the boy's death had been, more probably, occasioned by the ill-treatment of his father, I was solicited by the parents to open the body. On exposing the contents of the abdomen and examining the viscera, I found the large lobe of the liver torn asunder, and the spleen forced from its natural position into the hollow of the ribs on the right side, by the pressure of the wheels.

GENUS 4.—*Vulnus laceratum.* Lacerated wound.

What is the treatment of a lacerated wound, unattended with contusion or any other complication?

22. A simple lacerated wound, strictly so called, ought to be treated as an incised wound.

Describe the character of a compound lacerated wound.

23. A breach of continuity with irregular edges, accompanied by contusion, or the lodgment of extraneous matter or foreign bodies.

Is hemorrhage a frequent occurrence in this species of injury?

24. Certainly not; but, if present, it ought to be restrained in the usual way.

What is the primary treatment of a compound lacerated wound?

25. In the first place, having made a careful examination of the wound, we should cleanse it with a sponge and warm water (if at hand) of all coagulated blood and extraneous matter, and remove any foreign body which might be within our reach.*

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* To show the necessity of accurately examining even the most simple lacerated wound in appearance, I relate the following case: — J. K., falling from the step of a carriage against a blunt hook that supported a large gate, received a lacerated wound on the posterior and superior part of the right thigh, below the inferior margin of the gluteus maximus muscle. The orifice being small, and not suspecting that any foreign body was in the wound, I did not deem it necessary to examine its interior minutely. It was treated in the usual manner; but the wound not showing any disposition to heal, I introduced a common probe, which, to my astonishment, discovered a cavity that extended upwards, beyond its whole length, beneath the gluteus muscle. As the man had suffered no degree of pain, and as a considerable quantity of serous fluid had escaped, I attributed the vacuum to an effusion immediately consequent upon the infliction of the injury, and fully expected that, by the application of a compress, the cavity would unite and the wound heal. In this I was mistaken; and, after having employed in vain such means as I considered were best calculated for the purpose, I advised him to consult a London surgeon, who recommended the trial of a seton. This I accomplished by cutting down upon the blunt end of an eyed probe, ten inches long. The seton certainly improved the discharge, and doubtless contributed to what followed. Some weeks afterwards, the wound having discharged something remarkably fetid, the patient became extremely alarmed, and, fearing that mortification had taken place, sent in great haste for my assistant, Mr. Clark, of Farnham. The substance being washed, proved to be a small portion of corderoy, and a corresponding piece of lining, that had been torn off and forced into the wound.

"Parturiunt montes nascetur ridiculus mus."

The patient was perfectly well in a few days.

Should there be any portions of fascia partly detached, or any tendons be broken off and lying loose in the wound, how would you dispose of them?

26. Broken and contused portions of fascia ought to be removed by a clean-cutting scalpel, and such of the smaller tendons that may have been torn asunder, and are lying detached in the wound without the least prospect of re-union, should be cut off close to their connexions with the cellular membrane.*

This being done, by what means would you close the wound?

27. By strips of adhesive plaister, lightly applied.

Are not other means sometimes necessary to accomplish this object?

28. Sutures are sometimes employed to approximate the edges of a wound. In extensively incised and simple-lacerated wounds they may be occasionally used with advantage and without much hazard; but in wounds of this kind, where the parts are contused as well as torn, they *ought ever to be avoided*, except on the most necessitous occasions, lest they give rise to or promote tetanic affections; and when they are employed they should be introduced through the integuments only, and at a sufficient distance from the margins, by means of a clean, sharp needle.

In the event of sutures being employed in lacerated and contused wounds, what would be the best dressing to cover the wound?

29. The wound may be first supported by strips of sticking-plaister, lightly applied, and over these (especially should the vitality of the parts be doubtful) a warm linseed-meal poultice, or folds of linen made wet with a spirituous lotion, may be laid, and the whole retained in position by a few turns of a slack bandage.

Would the exposure of a portion of bone, denuded even of its periosteum, affect the above treatment?

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* In the following case considerable portions of two of the tendons of the extensor digitorum communis of the left hand were removed without any subsequent loss of muscular power. A young man, aiming to divide a stick with a bill-hook, missed the object, and struck the back part of his hand, cutting asunder two of the extensor tendons and the projections of the two corresponding knuckles. As the parts so separated were held at the metacarpal joints only by cellular membrane, I removed them entirely, and keeping the fingers extended by a splint placed beneath them, the lips of the wounded integuments were brought together, and retained in position by strap and bandage. The parts healed kindly by adhesion, and the power of extension did not afterwards appear to be impaired by the injury.

30. Certainly not. The suprajacent parts should be laid down upon it as if no portion of bone had been exposed.*

Are any measures to be taken relative to the constitution in lacerated wounds?

31. Having dressed the wound, and placed the parts in as easy a position as possible, it will be right to prescribe some Dover's powder to prevent or subdue pain and nervous irritation; and subsequently saline purgatives with the compound infusion of senna, at the same time directing a strict antiphlogistic diet.

Is not the system sometimes seriously affected by injuries of this kind?

32. Tetanus is not unfrequently the result of lacerated wounds, especially of those in which tendinous structure has been injured.†

State the varieties of this terrible disease.

33. It is usually divided into traumatic trismus and tetanus. Traumatic trismus signifies a violent spasmodic action of the muscles of the jaw; traumatic tetanus is signified when the spasm is extended more generally to the muscles of volition, and afterwards to those of respiration.

At what period after the infliction of the injury does this disease usually occur?

34. "It occurs at uncertain periods; but it is remarked that if it does not occur for twenty-two days‡ from the date of the wound the patient is safe."—*Sir James Macgrigor's Medical History of the Campaign in the Peninsula.—Med. Chir. Transactions*, vol. vi.

At what period does the disease usually terminate?

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* Sir James Earle mentions a case, in which he replaced a flap of integuments over two portions of the os frontis that had been denuded forty hours; and by so doing the wound healed by adhesive inflammation.

Earle's Edition of Pott's Works.

† It is doubtless on this account that severe injuries of the fingers and toes are so frequently followed by tetanus. Compound dislocations of these joints, especially of the thumb, are almost always attended by this disease. Indeed so constantly is this the case, that it ought to be established as a general rule to treat these accidents with amputation upon the spot. A physician, who has seen a great deal of military practice, assured me a short time since, that he had met with six cases of compound dislocation of the thumb, all of which had proved fatal from tetanus.

‡ In the Physical and Literary Essays and Observations, read before the Philosophical Society in Edinburgh in 1760, vol. iii. p. 557, I find a case of tetanus related by Dr. Alexander Monro, which occurred on the fifty-eighth day subsequently to a fracture of the leg, and was cured, after the failure of most other remedies, by salivation.

35. " It terminates on the second, third, and fourth days, and even as late as the seventeenth and twentieth day, though usually it is not protracted beyond the eighth."—*Ibid.*

Is there any difference with regard to the result between trismus and tetanus?

36. Sir A. Cooper, in his Lectures published by Mr. Tyrrell, says, " In every instance in which I have witnessed the existence of trismus the patient has recovered. But when the disease occurs in the form of acute tetanus, it usually proves fatal."

Is not tetanus divided into two kinds?

37. " There are two kinds of tetanus; one of an acute form, which usually terminates the patient's existence; and the other of a chronic nature, which, after a time, is often recovered from."—*Sir A. Cooper's Lectures by Mr. Tyrrell.*

What is the treatment of acute tetanus?

38. A variety of means have been employed for the cure of acute tetanus, but hitherto no certain remedy has been discovered.

Sir A. Cooper has seen tried the warm bath, bleeding, opium in immense doses, tobacco injections, digitalis, and ice; but without success.—*Ibid.*

Sir James Macgrigor says, " The remedies which have been chiefly trusted to for the cure of this formidable disease are opium, mercury, wine, warm and cold bath, venesection, ipecacuanha and digitalis in large doses, enlargement of the original wound, and amputation of the limb. These have been tried alone and in various combinations, and I am obliged to confess that the whole failed in almost every acute case of tetanus which occurred. The three first have been administered in unlimited doses without effect: the cold bath is worse than useless."—*Sir James Macgrigor's Medical History of the Campaign in the Peninsula. Med. Chir. Trans.* vol. vi.

Sir James also says, that " tobacco glysters, tried in the advanced stage of the disease, seemed to have no effect." " And that æther, camphor, musk, and other antispasmodics, as likewise the alkalies, were tried, and found equally unsuccessful."—*Ibid.*

He says in conclusion,—" At this moment I am unable to say precisely the number of cases that were treated, as they are included in the returns under the head wounds; however, there were some hundred cases affording room for extensive trials. I am, however, obliged to confess that little or no dependence is to be placed in any of the remedies, and I have to regret that the method of cure is yet to be discovered. In pointing out what military practice has enabled us to do towards ascertaining the effects of medicines in large doses, and carried to their ultimate extent, I hope to leave the ground more open for the trial of new remedies. Judging from the very few successful cases (of which he mentions six), we may be disposed to trust principally to blood-letting, purging, opium, and digitalis. As the disease appears to terminate in free sweating in some of the successful cases, Dover's powder may be useful, and the vegetable alkali and tobacco fume are deserving of further trial."—*Ibid.**

State the order in which the remedies, as far as they are at present known, should be applied in a case of acute tetanus.

39. First. All lacerated portions of fascia, and every irritating cause, should be removed from the wound, which may be penciled with lunar caustic and covered with a large linseed-meal poultice, to which may be added an adequate portion of powdered opium. The limb, or part injured, should now be laid upon a soft pillow, and in as favourable a position as possible.

Secondly. The whole of the muscles under the influence of the disease ought to be constantly embrocated with a warm mixture of equal parts of olive oil and laudanum.

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* On the subject of blood-letting, Sir James is at variance with Sir Astley Cooper, who says, in his published Lectures, that bleeding hastens the patient's death. (*Vide Sir A. Cooper's Lectures, by Mr. Tyrrell.*)—The following case will go to confirm his opinion.

An athletic young man, about twenty years of age, galled the sole of his left foot with a point of a nail, which projected into the shoe. From the want of care, and the application of shoe-maker's wax, the sore inflamed and suppurated; the lymphatics also, in their course up the leg, partook of the inflammation, and in the course of ten or twelve days tetanus supervened. A surgeon was now sent for, who bled him twice, and adopted such other means as were deemed most suitable to the exigency of the case. As the symptoms did not give way, he desired me to visit the patient, and the result of our deliberation was, that two grains of opium and two of calomel be taken every two hours; that a tobacco glyster be thrown up the rectum; that mercurial ointment be rubbed freely into the inner surface of the thighs; and that the neck and external fauces be frequently and diligently embrocated with a liniment made with equal parts of olive oil and laudanum. On the following morning we were much gratified to find that this mode of treatment had so much relaxed the muscles of the jaws and of the pharynx, that he was enabled to open the maxillæ to a considerable distance, and to swallow with ease. In the evening he was much the same, except that his pulse had risen considerably, in consequence of which the venesection was repeated. In a very short time afterwards the tetanic spasms returned with increased violence, and soon terminated his existence.

Thirdly. Two or more grains of opium (or a scruple of Dover's powder), with two grains of calomel, should be given internally every two hours, supposing the patient to be of the adult age, and the bowels kept soluble by occasional and adequate doses of the sulphate of magnesia, dissolved in the compound infusion of senna.

Fourthly. If the deglutition be impeded, an embrocation made of equal parts of the linimentum camphoræ, tinctura opii, and unguentum hydrargyri fortius, should be frequently rubbed into the neck, and a tobacco glyster administered per rectum as often as may be deemed necessary.

Should these means fail of success, what other remedies have you to propose?

40. Should the above treatment, after a reasonable trial, make no impression on the disease, large doses of the subcarbonate of iron may be given every two hours, and two ounces of the spirit of turpentine, mixed with a sufficient quantity of milk or gruel, may be thrown up the rectum three times a day.* According to Mr. Ward, of Gloucester, the Prussic acid has been productive of some good.

What is the treatment of chronic tetanus?

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* In the 15th vol. of the Medico-Chirurgical Transactions, page 161, Dr. Elliotson has given two well-marked cases of traumatic tetanus, which were decidedly cured by the subcarbonate of iron, in doses from ʒij to ℥ss. every two hours, being preceded by an injection per anum of two ounces of the oil of turpentine. He appears to found this practice upon a principle of analogy between this disease and chorea, which (he says) always yields to the use of the subcarbonate of iron. This assertion perfectly corresponds with the result of the same treatment in my own practice. Within the last year I have seen eight cases of chorea, all of which have yielded either to the subcarbonate or the sulphate of iron. Dr. Elliotson has been candid enough to add a third case in which the iron did not succeed, or rather in which it had not time to act; but I think with him, that the success of this remedy in the two first cases is sufficient to excite the Profession to the further trial of the powers of iron in tetanic diseases.

In the Medical Gazette for January, 1831, Dr. Gibbons, of Swansea, records a case of traumatic tetanus, which was successfully treated by injecting into the rectum, three times a day, ℥ij. of the oil of turpentine mixed with ℥j. of the olive oil and a sufficient quantity of gruel; by rubbing the body with a liniment, made with equal parts of oil of turpentine and laudanum, and by giving six grains of calomel once in six hours.

In the sixth vol. of the Med. Chir. Trans., page 65, Dr. Philips, of Winchester, mentions an instance of idiopathic tetanus in a young lady, which yielded to the use of the oil of turpentine, injected per rectum.

I have lately had an opportunity of putting Dr. Gibbons's mode of treatment to the test in a case of traumatic tetanus, induced by amputation below the knee, in a poor man about forty years of age, and I regret to add that it utterly failed.

41. "Chronic tetanus I have known relieved by calomel and opium, by the cold and shower baths, and by large doses of the tincture of muriate of iron."—*Sir Astley Cooper's Lectures by Tyrrell.*

What is the treatment of trismus?

42. "Calomel and opium are the best remedies; and a blister to the head the most efficacious local remedy."—*Ibid.*

Genus 5.—*Vulnus laceratum perforans.* A perforating lacerated wound.

What do you understand by a perforating lacerated wound?

43. This kind of injury signifies a deep narrow wound into or through a part of the body, accompanied by severe contusion, and occasioned by the velocity of musket-shot.*

In the treatment of this wound what ought first to engage your attention?

44. The general state of the patient. If he should be affected "with a deadly paleness, vomiting, profuse perspiration, and universal tremor, these symptoms," says the experienced Dr. Hennen, "will soon be relieved by a mouthful of wine or spirits, or by an opiate, but above all by the tenderness and encouragement of the surgeon."—*Military Surgery.*

Should a ball have passed through the fleshy part of the arm, thigh, or buttock, how would you treat the wound?

45. "We do no more than sponge the part clean, and place a small bit of folded lint on each orifice, which we retain by two cross strips of adhesive plaister, and two or three turns of a roller."—*Ibid.*

What would be your treatment of hemorrhage arising from this wound?

46. The wound should be dilated and the vessel secured. "If, however, as often happens, the original breach in the vessel cannot be discovered; or if, in the prosecution of our search after it, a number of enlarged and newly-formed collateral vessels are opened, and a general oozing takes place, the main trunk, above its first branch in the vicinity of the wound, or at its nearest and most convenient part, should be secured."—*Ibid.*

Suppose, from the relative situation of any large vessel to the wound, you had just grounds to conclude that it must be either

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* By this species is meant what is commonly called a flesh-wound, unconnected with fracture.

torn or injured, although it might not then bleed, would you not tie it, if possible?

47. " In every case where we can get at any large artery that may be injured we should invariably tie it, although at the time it may not bleed."—*Ibid.*

If it should not be within our reach, the patient should be carefully watched, and a tourniquet worn lightly around the limb, for immediate use if necessary.

How would you treat the lodgment of a musket-ball, in wounds of this description?

48. " We should lay it down as a rule not to be deviated from, to extract, on the spot, every extraneous body that we possibly can, either with the forceps alone, or with the aid of the bistoury."—*Ibid.*

"And if a ball, not having passed quite through the limb, be retained only by the elasticity of the common integuments, it should be cut upon and extracted at once."—*Ibid.*

The same author observes that " if balls lie very deep (which smooth leaden balls are particularly apt to do) without giving pain, they ought never to be removed."

Again, he says, " Except the ball, or other foreign matter, is completely in our power, we should never use the knife to enlarge the wound, or promise a certain extraction, however urgent the patient may be; for as nothing is more cheering to the patient than presenting him with the ball, so nothing is more disheartening, or tends more to shake his confidence in his medical attendants, than disappointment under these circumstances."—*Ibid.*

Are there any considerations or appearances that would guide you in searching for musket-balls in wounds of this kind?

49. In searching for musket-balls that have lodged within the body, we must bear in mind how variously they take their course. Doctor Hennen observes that they are turned from a right line by a very slight resistance; but if there be nothing to effect this that they will run along a continued surface—as the length of a bone, a muscle, or a fascia—to a considerable distance. " A ball will often strike the thorax or abdomen, and, to an inexperienced eye, will appear to have passed directly across, or to be lodged in one of the cavities. If great difficulty of breathing, or hemorrhage from the mouth, with sudden paleness and laborious pulse, in the one case—or deadly faintness, coldness of the extremities, and the discharge of stercoraceous matter from the wound in the second are not present, we shall find that, perhaps, the ball has coursed along

under the integuments, and is marked in its progress either by what Mr. Hunter compares to a blush, or by a wheal or dusky line, terminated by a tumor or opening, where it will be easily extracted."—*Ibid.*

"In some of these long and circuitous routes of balls, where we have not this mark, a certain emphysematous crackling often discovers their course and leads to their detection."—*Ibid.*

Is it not important that a wound should not be rudely and officiously handled in our search after balls?

50. A rough conduct in this respect betrays at once a want of skill and a want of feeling. The finger will generally be found the best instrument for probing a wound, conveying the most information to the surgeon and the least pain to the patient. When the foreign body cannot be reached by the finger, Mr. Samuel Cooper advises that "we should then consider all the circumstances which can assist us in forming a reasonable conjecture of the course of the wound, and give to a probe that curvature or form which we think most readily to pass along it, and proceed to make an examination."—*Dictionary of Surgery.*

Should the ball be discovered lying beyond the reach of the dressing forceps, could you adopt any method to bring it within the grasp of that instrument?

51. Dr. Hennen observes that in gun-shot wounds of the limbs "counter pressure will much assist us in bringing foreign bodies forward more immediately to the point of the finger."* In doing this the limb should be relaxed and put into a position favourable to the gravitation of the ball towards the surface, if it can be done without much pain.

What is the treatment of inflammation consequent upon gun-shot wounds?

52. General and topical bleeding; the application of folds of linen made wet with cold water, and kept in their proper

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* Foreign bodies, which we may have to extract, are of various kinds. Dr. Hennen divides them into three classes.

The first consists of the inflicting body itself, or the articles attached to it; viz. balls of every size, surrounded with cartridge paper or flannel, pieces of shell, bayonet and sword-points, lance-heads, &c.

The second, of substances forced in with the inflicting body; viz. pieces of clothing, buttons, coins, parts of breast-plates, of watches, their chains, and seals, keys, and all the different contents of a man's pocket or of the pocket of a near comrade, splinters of wood, stones, &c.

The third, of originally component parts of the body; viz portions of bone, &c.—*Military Surgery.*

situation by a slack bandage—which also should be kept wet—and purgatives conjoined with diaphoretics (such as the hydrargyri submurias, cum pulvere antimoniali). The limb should be placed in a relaxed position, and spasmodic action should be controlled by the pulvis ipecacuanhæ compositus. The diet should be purely antiphlogistic.

Genus 6.—*Vulnus a calore.* Wound from high temperatures of heat.

How would you divide this species of injury?

53. Into four degrees.

In the first, the action of the parts is simply augmented, without any displacement of the cuticle—characterised by merely a redness of the skin.

In the second, the action is still more augmented, accompanied with a displacement of the cuticle, and characterised by redness of the skin and vesications.

In the third, the action is diminished, and the organization of the parts endangered — characterised by a detachment of the cuticle, and a more or less pallid appearance of the cutis.

In the fourth, the organization is destroyed—characterised by the formation of dead crusts or eschars.

Are you of opinion that any one remedy, such as turpentine, linseed oil, &c. is adequate to the treatment of all degrees of injury, caused by the application of high temperatures of heat?

54. Certainly not; for as the effects of this cause vary in degree, the indications of cure will vary, and one remedy will not answer the various indications.

What is the indication of cure in the first and second degrees?

55. These being degrees of excitement,* the indication will be the same in both, viz. to reduce inflammation by abstracting the communicated caloric as speedily as possible.

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* To the degrees of excitement the application of the oil of turpentine is perfectly unjustifiable, as the following case will exemplify.

Mr. L. M. severely blistered the whole of the fingers and palm of the left hand by the explosion of a rocket. Turpentine was immediately applied. On the morrow I found him perfectly easy, but not from the turpentine. He told me that the pain from the remedy as well as from the accident had become so intolerable that he had been driven to throw aside the turpentine, and, in his own defence, to plunge his hand into a jug of cold water, which gave him instantaneous relief, and induced him to continue the cooling treatment till the pain had subsided. On examination, I found that the vesications were for the most part absorbed, and that the inflammation had almost wholly subsided.

What would be the readiest method of fulfilling this indication?

56. The instantaneous application of fluid or solid remedies of a low temperature. Of the former, cold water, being nearest at hand, should be chosen, and applied in a manner most suitable to the situation of the injury, either by immersion or aspersion; of the latter, flour should be selected, being generally to be procured in almost all situations of life, and applied as recommended by Dr. Ward, of Manchester, by shaking it from a drudger.

Which of these remedies ought to take the precedence?

57. In this degree cold water ought always to be the first application; and should the injury be confined to the extremities they may be immersed into it and kept there till the pain has been subdued; afterwards the parts scalded may be covered with flour.

But suppose a person to have fallen into a boiling fluid, that is, into a fluid heated at not less than 212° *Far., describe the manner of treating the case with both these remedies.*

58. First. Let the sufferer be instantly plunged into cold water, or subjected to the action of a pump, and kept under either of these processes till the pain has in a great measure subsided. At the same time let a sufficient quantity of flour be procured. This being done,

Secondly. Let the surface of the body be dried by *absorbing* the moisture with soft linen; and having laid the patient on a bed, apply the flour over the whole body by means of a drudger. The flour may be confined to the parts affected by wrapping the sheet around the body.

How frequently ought the flour-application to be repeated?

59. As often as a return of pain shall require it: at first about thrice and afterwards twice in the day. Doctor Ward advises the surface of the body to be covered with it to the thickness of half an inch.—*Vide Dr. Ward's first Letter to the Lancet of April,* 1828.

Should no flour be within our reach, what application ought to be substituted?

60. Bearing in mind the indication, viz. to reduce inflammation, we shall best fulfil it by the application of cold poultices of bread and water, of linseed-meal, of potato pulp, and the like; or, if it be at hand, the linseed oil mixed with lime-water: and, lastly, should there be no resources of this kind, we may apply linen compresses made wet with cold water.

Does the patient's general health require any remedy during these trying moments?

61. Most certainly. In severe injuries of this kind, where there is commonly extreme pain, we ought to give an adequate opiate, which may be repeated according to circumstances.

Do you think it good practice to open the vesications?

62. The opening the vesications by large incisions never fails to increase or occasion pain, and to retard the natural process of cure; but as soon as the pain, consequent upon the infliction of the injury, has wholly subsided, they may be opened with the point of a needle. Dr. Thomson observes that—" If a portion of the cuticle be removed, so as to permit the air to come into contact with the inflamed surface of the cutis, pain and a considerable degree of general irritation will necessarily be induced; but if the vesications be opened cautiously with the point of a needle, so as to allow the serum to draw off slowly, without at the same time allowing the air to enter between the cuticle and cutis, the early opening of the vesications will not only not occasion pain, but will give immediate relief, by diminishing the state of tension with which the vesications are almost always, in a greater or less degree, accompanied. When opened in this manner the vesications often fill again with serum; but the punctures may be repeated as often as is necessary without any hazard of aggravating the inflammation. Great care should be taken in every instance to preserve the raised portion of the cuticle as entire as possible."—*Thomson's Lectures on Inflammation.*

Treatment of the third degree.

What is the indication of cure in this degree, according to the foregoing division?

63. To restore the vitality of the parts in which it is suspended and endangered.

By what means would you fulfil this indication?

64. By the speedy application of the oil of turpentine on portions of lint, or cotton, or soft linen of any kind which may be at hand. If there be no turpentine, the parts may be fomented with water as hot as it can be borne. During the application of these means warm poultices of linseed-meal or bread should be prepared; and, some oil of turpentine having been poured upon the surface of them, they may be substituted for the former applications. Should no oil of turpentine be within reach, the warm poultices may be applied alone.

Would you apply cold to this kind of burn?

65. Certainly not; as cold applications would probably diminish the vitality of the part, and thus tend to destroy it.*

What internal treatment would you adopt in this case?

66. If the burn be extensive, a full dose of laudanum should be given in some wine and water, and repeated as often as it may be required; the patient should be put to bed, and during the winter season the temperature of the room should be increased by an adequate fire.

Treatment of the fourth degree.

What is the treatment of this degree, agreeably to the foregoing division?

67. In this kind of burn, the organization being literally destroyed, the injury is beyond the reach of any remedy whatever; still, as the vitality of the surrounding parts may be more or less endangered, it may be treated as the former in every respect, such treatment being best suited to prevent the extent of the sloughing and to promote its separation.

As it will frequently happen that the same injury shall exhibit all the degrees above mentioned, how would you adapt the treatment to such cases.

68. Here the injury must be ranked with the degree that principally prevails, at the same time varying the treatment according to circumstances. Thus, suppose the arm to be scalded generally to the first and second degrees, but here and there presenting examples of the third; in such a case, at the onset, this circumstance ought on no account to interfere with the treatment of the first and second degrees; but, previously to the parts being covered with flour or cold poultices the points injured in the third degree may be treated with the linimentum terebinthinæ spread on lint.

Again:—Should the second and third degrees equally prevail, the one may be treated with cold applications, and the other with turpentine and warm poultices.†

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* The following case will illustrate this point. A young lady having burnt her forehead to the third degree (characterised by a white patch of the integuments), by falling upon a live cinder, some cold water was immediately applied; but, instead of alleviating, it increased and aggravated the pain. The turpentine ointment being substituted, gave instant relief, though it failed to preserve the vitality of the part, which it probably would have effected, had it been applied upon the infliction of the injury.

† It is not within the province of this work to provide for the after-treatment of injuries; but I would here be permitted to observe, that whilst the

Genus 7.—*Vulnus a Frigore.* Frost-bite.

What is the appearance of a part under the influence of frost-bite?

69. Frost-bitten parts are generally of a white colour, being divested of the circulation of the blood.

What is the treatment of frost-bite?

surgeon is removing the dressings from extensive granulating surfaces, after the separation of the sloughs (an operation so much dreaded by the poor sufferer), he ought to be as expeditions as possible in his duty; to have the new dressings prepared, and placed conveniently near him, before he attempts to displace the old ones, and never to expose more than a small space at once.

Various applications have been recommended to promote the cicatrization of the wound. That which I have found to answer best is thick oil, such as what is vulgarly called neat's-foot oil, linseed oil, &c. This should be liberally smeared over the granulations, which may be subsequently covered with green cooling leaves, stripped of their fibrous parts, or with strips of adhesive plaister. The thick oil appears to moderate pain by acting as a pellicle in defence of the raw surface from the external air. And, in very extensive burns, might not the oil be absorbed and help to nourish the system?

I have thus, in a very rapid sketch, attempted to reduce the incipient treatment of these severe injuries to something like rational practice; and whether it succeed or not, I feel persuaded that any attempt to alleviate the anguish of such calamitous accidents will be at least excused. It is remarkable, that whilst the treatment of almost all other injuries has been placed upon a rational footing, and conducted upon scientific principles, that of burns and scalds has, until very lately, resembled more a kind of empiricism than sound practice. I by no means intend to assert, that no efforts have been made to improve the treatment of this kind of injury—as the subject has been lately treated very ably by various surgeons, especially by Mr. Dickenson—yet they do not appear to have laid down any clear method of treatment that could be instantaneously adapted to the different degrees above specified.

It will be seen that Heister, as far back as 1768, divided burns and scalds into four degrees. The words of his translator are as follow: "We may very fairly, therefore, divide burns or scalds into four degrees. The first, and the slightest, is that which occasions heat, pain, and a small vesication on the injured part in a short time. The second degree is, when the part is instantly affected with great pain and vesications. The third is, when the common integuments and subjacent flesh are so burnt, that they form a crust. The fourth and last is, where every thing is destroyed quite down to the bone. The third species is nearly allied to a gangrene, the fourth to a sphacelus."

The first two divisions are very similar to those which I have adopted; but although he says that "the intention is to disperse it (the inflammation) by the remedies which we advised for a phlegmon," he does not suggest any remedy that would probably be at hand, but advises the use of emollients and astringents, many of which he mentions, and amongst others oleum terebinthinæ.

70. "A frozen limb, in which there is no injury of an organic part, and no alteration but rigidity of the solids, and congelation of the fluids, may be recovered by the gradual communication of caloric to it. Experience has evinced that the whole body may be in the same condition, having all its vital powers suspended, and yet be restored to animation."—*Cooper's First Lines.* Small edition.

In what manner ought a cautious and gradual communication of heat to be accomplished?

71. By rubbing the parts with snow or ice water, until sensibility and motion return. "If the ear or tip of the nose should be the part concerned, care must be taken to avoid breaking it."—*Ibid.*

As soon as marks of sense and motion are discerned, Mr. Cooper advises friction with brandy, camphorated spirit, &c.

What ought next to be done?

72. "The next object is to endeavour to excite a perspiration, by giving some mulled wine, and putting the patient to bed in a chamber where there is a fire. In this situation he is to remain till he begins to perspire, which is generally succeeded by a perfect recovery of whatever sensibility may have been lost."—*Ibid.*

Would there be any hazard in the sudden application of higher degrees of heat in the first place?

73. The sudden application of higher degrees of heat, being more than the parts can bear, would speedily induce gangrene.

Should such an imprudent measure have been adopted, and gangrene be threatened, how would you endeavour to prevent it?

74. "By immersing the parts in water of a temperature nearly as low as the freezing point.* The parts must be kept immersed until the swelling, pain, and marks of discoloration begin to diminish, when friction, with spirit, may commence, and warmth be gradually increased."—*Ibid.*

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* In Captain Parry's First Voyage to the North Seas we find the following instructions on this subject:—"To prevent an excitement, which followed when these cases were not immediately attended to, we adopted the practice found most useful in cold countries, that of immediately immerging the injured parts in snow, or water kept by the continual addition of snow at 32° of Fahrenheit. They were directed to continue this application until some time after the pliability of the part had been restored." "In most of these cases this plan of treatment did not secure the patient against an accession of inflammation, which, although in general superficial, usually terminated in vesication of the whole surface, followed by an exfoliation of the nail and epidermis."

Suppose the whole body to be deprived of animation by extreme cold, in what manner would you attempt to restore it? *

75. "The whole body should be covered with snow, or placed in ice-cold water, so that the mouth and nostrils are not

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* In frost-bitten asphyxy, or that produced by intense cold, says Dr. Good, "the limbs are rigid, and the countenance pale and shrivelled. This variety is always preceded by an insurmountable desire to sleep, which the utmost exertion of the will is unable to overpower. The sleep is, in most cases, fatal, and becomes the sleep of death."—*Study of Medicine.*

Captain Cook, in the account of his first voyage round the world, remarks in these emphatic words, that "Whoever sits down will sleep, and whoever sleeps will wake no more." Dr. Solander, one of his fellow-voyagers, had nearly fallen a sacrifice in this way to the powerful effects of cold.

Captain Parry states that some of the effects of extreme cold upon the system so exactly resemble intoxication, that "a looker-on would not easily persuade himself" that persons so affected with cold had not been drinking too freely.—*Journal of First Voyage.*

Captain Parry relates also a very interesting case of frost-bite that occurred to one of the Hecla's crew, whilst in a temperature of from 43 to 44 of Fahrenheit. It is as follows:—"His (the patient's) hands presented a strange appearance; they were perfectly hard, inflexible, useless, possessing a degree of translucency, exhibiting more the external character of pieces of sculptured marble, than those of animated matter. They were immediately plunged into the cold bath, where they continued for upwards of two hours ere their flexibility was completely recovered; the abstraction of heat had been so great, that the water in contact with the fingers congealed upon them even half an hour after they had been immersed. During the cold application (which ought to have been called warm in comparison with the temperature of the hands) a considerable degree of re-action took place, attended by acute pain, from which the patient became so faint and exhausted as to necessitate his being conveyed to bed. In less than three hours very active inflammation had superseded, extending high up the arm, and soon afterwards each hand, from the wrist downward, was enclosed in a bladder, containing upwards of a pint of viscid serous fluid. There were, however, three of the fingers of the one hand, and two of the other, in which this vesication did not form; they continued cold and insensible; and whilst the arterial action was powerful as far as the first joints of these fingers, the vessels of their extremities were in a perfect state of collapsion." The animation of the fingers did not return, and they were eventually amputated. —*Ibid.*

In the island of Newfoundland, at the settlement of Fortune's Bay, this kind of injury is treated in a very summary manner by a female practitioner of no ordinary courage. As soon as she perceives that the frost-bitten part has irrecoverably lost its vitality, she commands the unfortunate sufferer to lay the limb upon a block, when this chirurgic heroine chops off the dead part with a stroke of an axe.

In confirmation of this assertion, I saw a poor lad, some years since, who, in consequence of his feet being frost-bitten, had undergone this terrible operation at both insteps, which had reduced him to the necessity of going on his hands and knees. Both his legs were subsequently amputated in the Exeter Hospital at the usual situation.

obstructed, and care is to be taken not to break any part. In this way signs of vitality must be awaited. When these appear, strong volatiles and sternutatories are to be applied to the nostrils, and air is to be blown into the lungs." Mr. Cooper next advises some warm wine to be injected through a hollow bougie down the œsophagus. And afterwards, "when the body has been thawed, and signs of returning animation increase, it is to be taken out of the water, rubbed with brandy, and conveyed into a warmer situation." Any diaphoretic drink should then be administered, and, as soon as the patient has been well dried, he is to be put to bed, and to remain there till he begins to sweat."—*Ibid.*

Doctor Good says, "After a short immersion in sea-water the body should be taken out, wiped perfectly dry, laid in flannel in a moderately warm room, and submitted to the friction of warm hands, several persons being engaged in this process simultaneously."—*Study of Medicine.*

How long after a patient has lain in this kind of asphyxia may a hope of a recovery be indulged?

76. So long as the heart may retain the power of action. Animation, suspended by the effects of cold, has been restored as late as six days after the occurrence.—*Vide Cooper's First Lines.*

Genus 8.—*Vulnus ab ictu Fulminis.* Injury from Lightning.

What is the treatment of a person who has been struck with lightning?

77. The Royal Humane Society recommends the following:—"When a person is struck by lightning, strip the body, and throw buckets full of cold water over it for ten or fifteen minutes; let continued frictions and inflations of the lungs be also practised; let gentle shocks of electricity be made to pass through the chest, when a skilful person can be procured to apply it, and apply blisters to the chest."—*Annual Report of the Royal Humane Society.*

Genus 9.—*Vulnus Specificum.* Specific wound.

Species 1.—*Morsus Rabidi Animalis.* Bite of a rabid animal.

Should a person be brought to you, having been bitten by a dog unprovoked, and under suspicious circumstances, what would be your first inquiry?

78. I should immediately make inquiry as to the state of the animal, which, if possible, should be kept alive.

What are the symptoms of hydrophobia in dogs?

79. The symptoms of rabies, according to Dr. Mead, are these:—"The looks of a dog in this condition discover a fever. He runs wildly forward, panting; snaps at every thing he meets; his tongue hangs out with slabber; his eyes are heavy, full of tears; he takes no food nor drink."—*Mead on Poisons.*

If the state of the dog should correspond with these signs, what mode of treatment would you adopt?

80. The bitten part should be immediately excised by means of a scalpel and dissecting forceps; and in so doing we ought to be careful to make the incision sufficiently deep and extensive, in order that the contaminated parts may be wholly extirpated. This being accomplished, the wound may be (if practicable) subjected to the action of a cupping-glass, and then washed with a strong solution of the nitrate of silver. It should, lastly, be covered with a linseed-meal poultice.

If an important part be involved in the injury, would you remove it?

81. If we have strong and *sufficient* reason to believe the bite to be that of a rabid animal, we ought to remove *whatever parts* may be affected. Mr. Cooper advises, should even a large artery be in the way, that it be exposed for a sufficient length, and secured by two ligatures, when the requisite extirpation of the parts between them may be safely performed.—*Dictionary of Practical Surgery.*

Is it possible that amputation may be required in an injury of this nature?

82. Certainly; the nature of the injury, independently of any rabid influence having been communicated, may require this measure. Again; although the injury of itself may not in any wise require it, still such a measure may be absolutely necessary; for example, suppose the palm of the hand or sole of the foot to be so *bitten through* by a dog, *known to be affected by communicated rabies*, that the complete excision of the parts shall be impracticable; the patient having before him the moral certainty of hydrophobia if the operation were not performed, we should be fully justified in performing amputation, as the least of two evils. But this ought not to be done without a deliberate consultation.

Is not sea-bathing considered effectual for the prevention of this formidable disease?

83. The lower classes of people always hasten to the sea to

undergo the process of being dipped. It is to be feared, however, that this measure is wholly unavailing; yet, could the mind of the patient be made easy by the adoption of such a remedy, it ought to be extolled rather than ridiculed, especially should the excision be positively objected to.

Are you acquainted with any specific remedy that may be internally administered, in conjunction with the practice of excision?

84. The madwort—plantane, has been recommended for the cure of persons bitten by rabid animals.* As soon, therefore, as the part has been locally treated in the manner already advised, ten or twelve grains of the root, in powder, may be given, and repeated at the end of two hours.—*Vide Black's Translation of Orfila.*

Species 2.—*Morsus Serpentis Venenosi.* The bite of a poisonous serpent.

What is the treatment of the bite of venomous serpents in tropical climates?

85. The best method of treating the bites of poisonous serpents upon the spot is excision;† but as this is not, in the

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* "This species of alyssum has for some ages been a popular remedy for canine madness, especially in the north of Europe; and in a late communication to Sir Walter Farquhar, in the Russian tongue, translated and published in the ninth number of Mr. Brande's Journal of Sciences and the Arts, we are told that it still retains its popular sway and reputation over a great part of the Russian empire, and that in the government of Isola it has never failed of effecting a cure in a single instance for the last five and twenty years."—*Good's Study of Medicine.*

In Johnson's edition of Gerard's Herbal we find the following account of the Alyssum Galeni:—" Galen saith it is given unto such as are enraged by the biting of a mad dogge, which thereby are perfectly cured, as is known by experience, without any artificiall application or method at all. The which experiment, if any shall proue, he shall find in the working thereof, it is of temperature nearly dry, digesteth, and something scoureth withal," &c.

In the thirteenth volume of the Medico-Chirurgical Transactions, p. 264, Mr. Hewit, surgeon of the Bombay establishment, met with five cases of hydrophobia communicated by bites of a rabid wild jackal, two of which were found dead; two terminated fatally before he had time to employ scarce any mode of treatment, and the fifth was most satisfactorily cured by mercurial ptyalism, excited by rubbing into the throat and the epigastric region an unlimited quantity of the mercurial ointment conjoined with camphor.

† This practice was recommended by Dr. Mosely, who had paid great attention to the subject during a long residence in the West Indies. He

generality of cases, practicable, from the rapid absorption of the poison, we shall be under the necessity of adopting other remedies.*

What are the principal antidotes that have been discovered for the cure of the effects of such poisons?

86. The guaco, arsenic, and the plantane.

In what manner ought the guaco to be administered?

87. This plant is found in several parts of America, of which the Indians make great use, for the purpose of defending themselves against the bites of the numerous venomous reptiles which infest their country. They swallow one or two spoonfuls of the juice of this plant, and inoculate themselves with it in five or six wounds, which they make principally in the sides of the chest and between the fingers. They are then enabled to take with impunity the most poisonous serpents; and if by chance they are bitten, all symptoms disappear shortly after the friction of the wound with the same plant.—*Vide Black's Translation of Orfila.*

What reason have you to assert that arsenic is an antidote to this poison?

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says, "The bites and stings of all venomous animals are cured by the same local means, which are very simple if they were always at hand. The part injured must be instantly destroyed or cut out. Destroying it is most safe, and equally certain; and the best application for that purpose is the lapis infernalis, or the butter of antimony. The bitten part must be destroyed to the bottom, and when there is any doubt that the bottom of the wound is not sufficiently exposed, butter of antimony should be introduced into it the following day as deep as possible, and incisions should be made, to lay every part open to the action of these applications."—*Encyclopædia Britannica,*—Article, Serpent.

* Poisonous serpents belong to the genera crotalus and coluber of Linnæus; and the symptoms that follow their bites, according to the Abbe Fontana, who made six thousand experiments on the bite of the viper, are these:—"Acute pain in the part wounded, which extends over the whole limb, and even to the internal organs, with tumefaction and redness, which passes afterwards to livid, and gains, by little at a time, on the neighbouring parts; considerable syncopes; pulse frequent and small, concentrated, irregular; difficulty of breathing; copious and cold sweats; disturbance of vision and the intellectual organs; heaving of the stomach, bilious and convulsive vomiting, followed almost universally by a general yellowness; sometimes pains in the unbilical region. The blood which flows at first from the wound is frequently blackish. Some time after there issues out a sanies, and gangrene takes place when the disease is about to terminate in death. Climate, seasons, temperaments, &c., exert a singular influence on the nature and progress, more or less rapid, of the symptoms occasioned by the bite of these animals."—*Orfila.*

88. Of arsenic, as a remedy for the bites of venomous serpents, Mr. Ireland has published some important facts in the second volume of the Medico-Chirurgical Transactions, p. 393, by which account it appears that he succeeded in curing several persons bitten with a large and most poisonous serpent—the Coluber Carinatus of Linnæus. His mode of treatment, as regards this remedy, is as follows:—

1st. He invariably removed the ragged edges of the wound.

2nd. He gave *two drachms* of the arsenical solution, in combination with ten drops of the tincture of opium, half an ounce of lime juice, and ℥iss. of peppermint-water every *half hour* during about three hours.

3rd. A cathartic glyster was administered, and repeated as often as was necessary.

4th. The parts injured were frequently fomented by a common fomentation, and rubbed with an embrocation, consisting of equal parts of the oleum terebinthinæ, liquor ammoniæ, and oleum olivæ.

What do you know of the plantane as a remedy for these poisons?

89. In Duncan's New Edinburgh Dispensary I find the following observation: "Plantane has been alleged to be a cure for the bite of the rattlesnake; for this there is, probably, but little foundation, although it is one of the principal ingredients in the remedy of the negro Cæsar, for the discovery of which he received a considerable reward from the assembly of South Carolina." In Preswick's Dissertation on Mineral, Animal, and Vegetable Poisons, published in 1775, this notable recipe stands thus:—"Take of the roots of plantane, or the wild or black horehound (in the summer months, roots and branches together), a sufficient quantity; bruise them in a mortar, and squeeze out the juice, of which give, as soon as possible, one large spoonful. If he is swelled you must force it down his throat. This generally will cure; but, if the patient finds no relief in an hour after, you may give another spoonful, which never fails. If the roots are dried, they must be moistened with a little water. To the wound may be applied a leaf of good tobacco, moistened with rum."*—*Page* 220.

* Lieutenant-General Sir Howard Douglas, Bart., F.R.S., and then Governor of New Brunswick, communicated to me a fact connected with this remedy, which is very important. He stated, that whilst walking near the Lake Ontario, in company with some Indians, one of them was bitten at the

*Are there any other remedies that have been considered as antidotes to viperine poison?**

90. The volatile alkali, especially in the form of the Eau de Luce, has been considered by some as such; but, according to Mr. Orfila, its efficacy has been disproved in a great number of experiments made by the Abbe Fontana; in addition to which, it decidedly failed in the case of Thomas Soper, who was bitten by a rattlesnake in this country in the year 1809, and died in St. George's Hospital. Many other applications have been extolled as remedies in this case, such as oil, viper's fat, treacle, &c.; but there does not appear sufficient proof of their efficacy to entitle them to our confidence.

Should none of the above-mentioned means be practicable, are there any other measures that could be substituted?

91. Under such circumstances the patient should immediately pass a ligature around the limb and above the injury, sufficiently tight to prevent the absorption of the poison; and, having guarded his mouth with oil, or some such means, he should, as soon as possible, suck the wound,† taking care to

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upper part of the foot by a rattle-snake. On receiving the wound the poor man immediately looked around him with the greatest earnestness and anxiety, as if in search of something, and very soon expressed the greatest delight at having found some plantane. Of this he gathered a sufficient quantity, and having beaten it into a pulp, and scarified the part affected, he instantly squeezed some of the juice into the wound, and swallowed as much more as he could express. Afterwards, he applied the remaining pulp to the bite, and *by such means prevented any ill effects of the poison.*

* The tanjore pill is a remedy which has been celebrated for the cure of viperine poison, the principal ingredient of which is the arsenious acid. It is probable that the discovery of this remedy suggested to Mr. Ireland the free use of the arsenical solution.

† To show the efficacy of suction, I find the following case, related by Mead, which occurred in London in 1697:—"A man was bit on one of his fingers by a rattlesnake just brought over from Virginia; he immediately put his finger into his mouth and sucked the wound. His under lip and tongue were presently swelled to a great degree. He faultered in his speech, and, in some measure, lost his senses; he then drank a large quantity of oil, and warm water upon it, by which he vomited plentifully. A live pigeon was cut in two and applied to his finger. Two hours after this, the flesh about the wound was cut out, and the part burnt with a hot iron, and the arm embrocated with hot oil. He then recovered his speech and senses. His arm continued swelled the next day, but, by common applications, soon grew easy, and the patient suffered no further mischief."—*Essay on Poisons.* In this case it is probable that the suction and the emetic were the principal means of recovery.

spit out the impregnated saliva very frequently. After this he will do right to take a vomit, and promote its effects with oil and tepid water.

Is the bite of the viper of this country (the coluber berus) generally fatal?

92. Certainly not; yet in certain seasons of the year, and under peculiar circumstances, it has sometimes proved fatal.*

In what manner would you treat the bite of the coluber berus?

93. On the spot I would excise the bitten part; and this may be the more easily done, as the wound is small and not deep. If, however, the poison should be making its way into the system, the plantane may be used both externally and internally, as recommended for the bite of the rattlesnake.

Would you feel justified in the use of the arsenic in this case, as recommended by Mr. Ireland for the bites of more venomous serpents?

94. Most assuredly not; for, as this injury is not commonly fatal, so I would not employ a remedy, which, in itself, may be followed by serious and fatal effects. A desperate remedy is admissible only in desperate cases.

If no plantane could be procured, or if it should fail to produce any curative effects, how would you proceed?

95. The wound should be treated both locally and constitutionally, upon general principles—that is, by the antiphlogistic plan.

SPECIES 3.—*Vulnus Scorpionis.* The sting of the scorpion.

What are the symptoms of the sting of the scorpion?

96. I cannot answer this question better than by relating a case from Amoureux, in his Notice des Insects de la France réputés venimeux. " An adult man of Montpellier was stung by a scorpion at the bottom of the left thigh. He was at first less sensible to the sting than to that of a bee. The next day he experienced great tension, with sensibility, up to the middle of the thigh, attended with an erysipelatous redness. The place of the sting was of a deeper red, bordering on black from four to five lines in diameter, and without any regular form. There was no effusion of blood. The symptoms continued six or seven days, and disappeared of their own accord,

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* Case—John Boxy, of Chillworth, near Southampton, aged two years and a half, was bitten by a viper on the left ankle. The part immediately became discoloured and very much swollen, and the child died in five hours after the infliction of the injury.

without having had recourse to any other application than that of saliva. The brown spot remained about a fortnight." According to the same author, the constitutional symptoms which are most frequently produced are "fever, cold shiverings, and numbness; vomitings have sometimes been observed, and singultus, with pains all over the body, and tremblings."

The symptoms, however, will vary according to the size of the animal, and the climate to which it belongs. In general this animal is more dangerous in southern than in other countries.

What is the treatment of the sting of the scorpion?

97. When the effect is severe, Orfila recommends us to give the volatile alkali internally, and to apply it externally upon the surface of a soft linseed-meal poultice.

SPECIES 4.—*Vulnus Apium et Vesparum.* The sting of bees and wasps.

Under what circumstances may the stings of these insects be attended with dangerous consequences?

98. The sting of an individual bee or wasp upon the surface of the body is more severe than serious; but if either of them should sting the tongue, pharynx, or œsophagus in the act of being swallowed accidentally;* or if a person be stung by a swarm of bees, or several of the large kinds of wasps, the result may be extremely dangerous, if not fatal.

What is the best treatment of a person stung by a swarm of bees or wasps?

99. We ought to endeavour, by means of a fine pair of forceps, to extract as many of the stings as possible, after which the parts may be covered with linen compresses, made wet with a mixture of laudanum and cold water,† or by the

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* Orfila states, that in the Gazette de Santé, No. 45, An. Do. 1776, will be found the case of a gardener of Nancy, who was stung near the velum pendulum palati, and which proved fatal in a few hours.

He mentions also, that in the Dictionaire des Sciences Medicales, Art. Abeille, there is a case related by Mr. Chaumeton, of a person who was stung in the œsophagus by a wasp, and who was recovered by drinking, at several different times, a very strong solution of common salt in water. He states that the alarming symptoms subsided almost at once, and disappeared as if by enchantment.—*Black's Translation of Orfila.*

† The Prussian blue is a popular remedy for this injury. I cannot, however, speak positively of its efficacy. It should be dipped in water and laid upon the part as a pigment.

latter alone, should no laudanum be at hand. At the same time we should do right to appease the pain by a suitable opiate.

State the treatment of a case in which the tongue, pharynx, or œsophagus, has been stung by one of these insects?

100. If there be danger of suffocation from the tumefaction, the operation of laryngotony or tracheotony should be immediately performed. The swollen parts may be scarified or leeched, and the throat may be constantly gargled with iced or salt and water, or by the capsicum or ammonia dissolved in water.

Upon what principle do you recommend the last stimulating applications?

101. Such stimuli reduce inflammation of the internal fauces by exciting the secerning membrane to pour out a copious flow of its proper mucus. It is precisely in this manner that the tincture of opium, the unguentum hydrarg. nitratis, and other stimulants, applied to an inflamed conjunctive membrane of the eye, subdue inflammation by exciting a flow of tears.*

I have not ranked the bite of the Tarantula spider amongst those urgent injuries requiring medical treatment, as the poison of this insect has been long divested of its wonted terrors, and as the powers of music are no longer invoked to charm away its once dreaded effects.

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* Before I dismiss the subject of animal poisons, I would say a few words on the power of the toad (rana bufo of Linnæus,) to secrete and emit a poisonous fluid. Whilst many of the older writers declare this reptile to be poisonous, most of the moderns have denied that it possesses such a property. (Vide Encyclopædia Britannica, Wood's Zoology, &c.) Pelletier, however, has analyzed the venom of the common toad, and states it to consist of an acid of a very bitter and even caustic fat matter, and an animal matter having some analogy to gelatine.—*Lon Med. Repos.* vol. ix. p. 168.

The following case may, perhaps, throw some light upon the subject:—Thomas Lickfold, of the village of Wrecklesham, near Farnham, in Surrey, whilst in the act of irritating a toad, found some liquid of intense bitterness fall upon his lips. Not being aware of its nature, he repeatedly licked the external parts of his mouth to get rid of the taste. In about an hour he felt a nausea, accompanied with the same intense bitterness arising from his stomach. His lips, tongue, and pharynx now began to swell—so much so that he could scarcely swallow or articulate. The abdomen became generally tumid, tense, and sore; and he felt a sense of trembling of the stomach, accompanied with a drowsiness, vertigo, and dimness of sight. By the advice of a medical man, he applied an oily mixture to his lips, internal parts of the mouth, and pharynx, and took some castor oil. The latter operated by vomiting and purging, and greatly relieved him. The swelling of the mouth subsided in about three days, but the abdomen was not reduced to its natural size for several weeks.

SPECIES 5.—*Vulnus a cuspide venenatâ.* Wound from a poisoned arrow.

What is the treatment of wounds of this kind?

102. Wounds from poisoned arrows ought to be treated in the same manner as those occasioned by venomous serpents; but as this kind of injury is inflicted only in barbarous countries, and as we know little of such acrid poisons, and less of their antidotes, the question can be answered at best but very imperfectly.* Sea-water, or common salt and urine, have been recommended by Gillii and M. de Humboldt. The latter also says that sugar is the most celebrated antidote for the poisons of the River of the Amazons. I should say that the immediate application of a ligature (where such is practicable,) above the injury, and amputation, or excision and the actual cautery, are most to be depended on.

SPECIES 6.—*Vulnus a scalpello venenato.* Wound from a foul scalpel or needle.

What is the treatment of a wound occasioned by this cause?

103. Much will depend on the nature and state of the subject under dissection, as well as upon the character of the wound.†

1stly. Should the wound be a puncture, it should be immediately extended into an incision.

2dly. As much blood should be squeezed out as possible, and the wound subsequently sucked, with the view to extract all the irritating fluid that may have been introduced.

3dly. The surface of the wound should be touched with some caustic application, such as the nitric acid, the nitrate of silver, or the caustic potass; and in some cases it may be necessary to excise the wound.

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* The Indians make use of different kinds of poisons for the arming of their arrows; the principal of which are—the upas antiar, the ticunas, the woorara, and the curare.—*Vide* Orfila.

Mr. Hancock gives an interesting account of the worari in the Medical and Physical Journal for November, 1829.

† It would appear that wounds inflicted during the examination of the bodies of women, dead of puerperal fever, have frequently been attended with severe consequences. Sir Astley Cooper relates one case; and in the late Dr. J. Clarke's Practical Essays I find the following note:—"I have known two instances in which gentlemen opening the bodies of women, who had died in this disease, accidentally wounded their hands; the consequence of which was, swelling of the whole limb and of the axillary glands, and low fever, with frequent pulse."

4thly. The part should be enveloped in cloths made wet with some refrigerant lotion, to prevent inflammation; and the limb kept in a quiescent position, and supported on an inclined plane, so that the blood may gravitate towards the body.—*Vide Sir Astley Cooper's Surgical Lectures*, by Tyrrell.

As many promising young men have fallen victims to this injury, do you know of any method that could be adopted to prevent it?

104. I am persuaded that this evil may be commonly avoided by a little more care on the part of those, whose zeal renders them the most obnoxious to it. In the dissecting-room, as soon as an instrument is no longer in use, it should be returned to its proper case, and not be permitted to lie on the subject or on the table; and when two gentlemen are dissecting together, the greatest care should be taken that the points of their scalpels and needles be not placed in such positions as to wound the hand of either operator—an accident that too frequently happens in the inspection of dead bodies. Moreover, it has often occurred to my mind that, for the dissection of very putrid subjects, a dissecting-glove might be invented to guard the hand both against wounds of the needle, &c., and the absorption of putrid matter. This precaution might render the important pursuit of morbid anatomy much less hazardous, if not divested of all danger.

Class II.—*Cranialia.*—Cranial emergencies.

Order I.—*Injuriæ.* Injuries of the head.

Genus 1.—*Vulnus superficiale.* Scalp-wound.

What is the treatment of an injury of the scalp?

105. Injuries of the scalp, simply considered, should be treated upon general principles; but the surgeon will do right to cause the head to be shaved to a considerable extent, so as to allow of a free examination of the part injured, and of such external applications as may be necessary. After such an injury, he ought also, if the blow have been severe, to take blood either from the system or from the part itself, or from both; to apply linen cloths, wet with a cold wash, to the scalp, or (should there be a breach of continuity) over the dressings; to keep the head elevated; to administer a purge; and to enjoin a strict antiphlogistic regimen.

Should a flap of integument be detached, contused, and discoloured, would you remove it?

106. Certainly not. It ought to be laid down in the manner recommended for the treatment of lacerated wounds, in the hope of its vitality being preserved, and its re-union with the adjacent parts restored.

*What treatment is required for an extensive extravasation under the scalp?**

107. Linen compresses, wet with cold lotion, should be kept constantly applied over the tumour, till the extravasated fluid has been absorbed. Mr. Brodie mentions a case in which the whole of the scalp was so completely raised by the extravasation, that the cranium was not in any part perceptible to the touch, and in which this treatment was sufficient.—*Vide Mr. Brodie's paper on Injuries of the Brain.—Med. Chirur. Trans.* vol. xiv.

What would you consider the cause of so general an extravasation?

108. A rupture of the temporal or occipital artery. Mr. Brodie discovered this in the second case of the kind which he relates. In this instance, the tumour began from the course of the temporal artery, was gradually occupying the cellular texture, and would probably have forced its way under the whole of the scalp, had he not have placed a pad upon the trunk of the artery, and thus stopped the progress of the extravasation.—*Ibid.*

GENUS 2.—*Fractura.* Fracture.

What is the treatment of a fracture of the cranium without any displacement of bone or cerebral symptoms?

109. A fracture of the cranium, abstractedly considered, without displacement of bone or cerebral disorder, cannot require any interference on the part of the surgeon. The injury of course implies a wound of the scalp, which ought to be dressed as if no fracture had occurred. At the same time, such an occurrence would demonstrate the force that had inflicted the injury, and awaken us to active antiphlogistic measures, such as adequate venesection, &c.

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* Extravasation under the scalp frequently occurs to new-born infants. The skin ought never to be punctured. The application of compresses, moistened with spirit-lotion, and subsequently a soap-plaister, will generally suffice.

Should a portion of the bone be displaced and depressed upon the dura mater by a simple fracture, would you elevate it with the trephine?

110. Simple fracture, with depression and without symptoms of compression, ought not to be trephined.

What treatment would you adopt under such circumstances?

111. The patient should be bled copiously, and placed under the most rigid antiphlogistic plan. The head and trunk should be raised, and the hair shaved off from the seat of the injury, to make room for the application of leeches, and subsequently the cold lotion.

Would a compound fracture, with depression, and without cerebral disturbance, require a different treatment?

112. Sir Astley Cooper has stated, in his Lectures on Surgery, that "there is a great difference, as to the danger of inflammation and suppuration of the membranes of the brain, between those cases, in which the fracture and depression are complicated with a wound of the scalp, and those in which the soft parts are uninjured; such mischief being much more liable to occur in cases of the first kind than in those of the second."

The accuracy of this opinion Mr. Brodie was in the first instance inclined to doubt; but, from his own subsequent experience and observation, he came to the same conclusion.

"Taking all these facts into consideration, and endeavouring to give its proper value to what may be urged on either side of the question, I cannot but acknowledge, whatever may have been my first impression on the subject, that it appears to me at this moment that the views of Sir Astley Cooper are well founded; and that, in those cases in which a depression of bone exists without any symptoms, or with only trifling symptoms arising from it, the surgeon can follow no better general rule than this: If the depression be exposed in consequence of a wound in the scalp, let him apply the trephine, and elevate the depression."—*Med. Chir. Trans.* vol. xiv.

Upon what grounds do you consider the operation requisite?

113. Upon the probability that, under such circumstances, inflammation and suppuration might ensue between the bone and dura mater.

But would it not be better to wait till such circumstances took place—thus giving the patient the chance of no such occurrence, and of being relieved by the trephine if it should be required?

114. Certainly not; since the operation would be infinitely more profitable to the patient, when applied simply to raise a portion of depressed bone, and to prevent the almost certain consequence of inflammation and abscess, than when employed after such results had taken place.

Is there any exception to the rule of applying the trephine in this case?

115. Yes. "The bone may be depressed in such a manner as to allow the escape of the pus which is formed on the dura mater, although the depression is not elevated." In such a case, if there be no symptoms of compression, Mr. Brodie does not recommend the use of the trephine, and adduces a case to support this point of practice.—*Ibid.* p. 403.

If a fracture and depression of bone be complicated with a wound of the membranes of the brain, or of the brain itself, how would you treat the case?

116. "If the edge of the depressed bone be imbedded in the substance of the brain, it may be proper to restore it to its natural level, provided this can be readily accomplished by the forceps or elevator. But individuals have recovered in whom a depression of bone has been allowed, under these circumstances, to remain without being elevated; and it cannot be advisable to risk this chance of recovery, whatever it may be, if the elevation requires the application of such a degree of force as is likely to cause the most trifling additional injury to the wounded brain." "The motion of the saw must occasion more or less jar to the tender substance; and this, which may be of little consequence where the brain and its membranes are entire, may make a serious difference, as to the degree of danger, where these parts are already lacerated and contused."—*Brodie, &c.*

But were such a case accompanied with symptoms of compression, the bone ought to be cautiously elevated at all hazards.

Should the bone be splintered, and driven into the substance of the brain, without having produced symptoms of compression, what would be your conduct?

117. Here, again, "A judicious surgeon will always bear in mind that, especially on these occasions, the first rule of his art is not to add to the mischief already done. If splinters of bone have penetrated into the brain, and can be removed with perfect facility, and without the smallest additional disturbance to the injured organ, such removal cannot be improper, and may probably be useful. Many persons, however, have

recovered in whom an opposite practice has been pursued. Do not such cases justify us in leaving splinters of bone untouched where there is any kind of obstacle to their easy extraction?" —*Ibid.*

Suppose a musket-ball, or any other foreign body, be lodged in the brain, would you attempt to extract it?

118. When a musket-ball has entered the substance of the brain, "it rarely happens that it can be discovered and extracted even by the lightest and most practised hand without such a degree of violence as must be in itself sufficient to produce a train of evils which in all probability would terminate in death."—*Ibid.*

Mr. Brodie goes on to say, that "there are numerous instances of persons who have recovered, although the ball was allowed to remain in the brain; some of whom have suffered no more than they would have suffered from its being lodged in a less important part of the body;" and then asks this question, "Taking all these things into consideration, ought we not to regard it as a general rule, that the extraction of a ball should not be attempted; an exception to the rule being made only to those cases in which, from its more superficial situation, and other circumstances, the extraction can be easily accomplished without the employment of force, and without adding in any degree to the mischief already done?"

This rule is equally applicable to the extraction of any other foreign body; it must ever be influenced by the peculiar circumstances of the case, but chiefly by the facility or difficulty of the extraction. Perhaps a proper question to be put is this, will the amount of danger be greater in the extraction of the foreign body or in suffering it to remain?

What injury of the head invariably and without delay demands the use of the trephine?

119. Compression of the brain—arising either from a depression of bone, the pressure of a foreign body, or from the extravasation of blood (resulting from external violence) upon or immediately beneath the dura mater.

GENUS 3.—*Compressio cerebri.* Compression of the brain.

What are the symptoms of compressed brain?

120. The ordinary symptoms of compression are, a loss of sense and voluntary motion, slow and stertorous breathing, dilatation of the pupils, and the involuntary discharge of fæces and urine.

Is the pulse commonly indicative of compression?

121. Not constantly; for "sometimes, where the other symptoms of pressure exist, there is no alteration of the pulse." Mr. Brodie, however, is of the opinion, "that pressure on the brain for the most part affects the action of the heart; not by producing actual interruption, but by causing its contractions to be either less frequent or less forcible than natural."*—*Med. Chir. Trans.* vol. xiv.

Ought these symptoms to be complete to constitute a case of compression?

122. No. The insensibility "is sometimes incomplete, corresponding to what is observed in cases of concussion of the brain; the patient lying for the most part unconscious of what passes around him, but capable of being roused by stronger impressions on his senses." And "where there is an imperfect loss of sense, there are often no marks of paralysis whatever." "Occasionally the paralysis is confined to one set of muscles, or even to a single muscle." "The state of the pupils varies very much in cases of pressure on the brain, even under circumstances apparently similar." "Sometimes they dilate with the absence and contract with the presence of light; but this is a rare occurrence where the other symptoms of pressure are present." "It is not uncommon for the pupils to remain for a time in a state of dilatation; then to become contracted; and, after remaining so for a shorter or longer time, to become again dilated: these changes taking place independently of light and darkness."—*Brodie, &c.*

Dr. Hennen, in his Military Surgery, mentions a case of compression from extravasation, in which the pupils were observed sometimes to become dilated with an increase, and to contract with a diminution of light. At other times one pupil will be permanently contracted, and the other permanently dilated. Again, one pupil may be dilated and the other natural.—*Ibid.*

Would the contraction of the pupils prove the non-existence of compression?

123. A contractibility of the pupils, upon exposure to light, ought generally to have weight in our consideration, especially

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* This fact (if proof were wanting to establish it,) was a few weeks since strikingly illustrated in my own practice. A gentleman, fifty-seven years of age, was seized with an apoplectic attack. I saw him a few minutes before the seizure, when the pulse was eighty in the minute; and, when I visited him a short time afterwards, the pulse was weak, and not more than forty. This case terminated fatally in two days.

if the other symptoms be equivocal; but a permanent contraction of the pupils is a decided proof of pressure.

What is the indication of cure in the treatment of a case of cerebral compression from external violence?

124. To remove the pressure.

When you are called to a case, exhibiting the symptoms of compression, in what manner would you proceed to remove the cause of the pressure?

125. If the case be that of fracture, and there be a wound of the integuments sufficiently extensive to allow of the application of the trephine, having caused the head to be shaved, and placed the patient in a convenient posture, I would use that instrument at once; if there were no such breach of continuity, I would immediately divide the integuments over the injury for that purpose.

Is there no measure to be adopted prior to this?

126. If a large quantity of blood had not been lost from the wound, the patient ought assuredly to be bled previously to the operation.

Suppose there were no external marks to guide you in making your incision through the scalp, would you feel justified in cutting down upon the cranium at all?

127. In such a case the head ought to be wholly shaved, and *most carefully* examined with a view to ascertain the seat of the injury; at the same time we should make diligent enquiries as to the precise posture of the body and direction in which the blow or violence was received, in order to find out the probable situation of the pressure. If we should arrive at such knowledge, we ought not to hesitate to investigate the state of *the skull* at that point. But if no clew whatever could be discovered, no incision ought to be made, and the case should be treated as one of apoplexy.

Suppose you had some evidence, although that evidence may be obscure, of the injury having fallen on that part of the cranium in which the middle meningeal artery is situated, would you not trephine in the course of this vessel?

128. Yes. "The use of the trephine may be resorted to on speculation, rather than that the patient should be left to die without an attempt being made for his preservation."—*Ibid.*

Describe the course of the meningeal artery.

129. This artery is a branch of the maxillaris interna, and having passed through the foramen spinale of the sphenoid bone, springs upwards on the internal part of the inferior and

anterior angle of the parietal bone, and ramifies between that bone and the dura mater.

Again,—Should there be a well-marked external appearance (for instance, a puffy tumour,) accompanied with symptoms of compression, and having cut through it, and found no trace of fracture, are there any other circumstances that would lead you to conclude that extravasation had taken place beneath?

130. On this point my judgment would be assisted by what Mr. Abernethy has laid down. He says, "If there be so much blood on the dura mater as materially to derange the functions of the brain, the bone to a certain extent will no longer receive blood from within; and by the operation performed for its exposure, the pericranium must have been separated from its outside. I believe that a bone so circumstanced will not be found to bleed, and I am certain that it cannot bleed with the same freedom and celerity as it does when the dura mater remains connected with it."—*Abernethy on Injuries of the Head.*

In operating for depressed bone, is any other saw used beside the trephine?

131. Hey's saws are frequently in use; indeed no trephining-case is complete without them.

Is it necessary to remove a considerable portion of the cranium to admit of the use of the lever?

132. "In applying the trephine on account of a fracture with depression, the removal of a small portion of bone is generally sufficient; and there is, indeed, no sufficient reason for removing any considerable portion of the cranium."—*Brodie on Injuries of the Brain.—Med. Chir. Trans.* vol. xiv.

Does the same rule obtain where the symptoms arise from extravasation?

133. No. Where the pressure is occasioned by extravasated blood as well as by a depression of the bone, or by the former only, it will be right to remove as many circles of the cranium or as much bone as will admit of the whole of the extravasation to be taken away.

But should you not find any extravasation betwixt the bone and the dura mater, and should the latter be of a blue colour, and protruded into the aperture you have made, what conclusion would you draw?

134. I should conclude that the extravasated blood lay beneath the dura mater.

What would be your practice under such a circumstance?

135. I should puncture the dura mater with the point of a lancet.

But are not wounds of the dura mater, even of the slightest kind, highly dangerous to the patient?

136. "Every thing that we see of wounds of the dura mater tends to prove the very great danger of this kind of injury. The dura mater should never be wantonly punctured; but we cannot doubt that, in what may be regarded as desperate cases, it must be right to give the patient the chance, such as it may be, which the division of the dura mater affords him."—*Ibid.*

In support of this practice Mr. Brodie mentions two successful and highly interesting cases, one of which occurred to Mr. Chevalier, and the other to Mr. Ogle, of Great Russel Street.—p. 390, 391, *Med. Chir. Trans.* vol. iv.

Is there any part of the calvarium that forbids the application of the trephine for the symptoms of cerebral compression?

137. None whatever, provided its application shall be compatible with the *possibility* of relieving the patient. In this operation, as in all others, the surgeon must proceed with the greatest caution and self-possession. As he approaches the dura mater, he ought to be extremely careful not to wound it; and the same care, that shall avoid injuring this membrane, will keep harmless every part beneath the saw.

Genus 4.—*Concussio cerebri.* Concussion of the brain.

What are the symptoms of concussion of the brain?

138. The ordinary symptoms of concussion are—confusion of intellect, accompanied with vomiting; the patient is at a loss to know what has befallen him, and talks like a person intoxicated; or he lies in a state of stupor, and shows a peevishness on being roused. Sometimes, though rarely, this stupor amounts to an insensibility that terminates in death. The memory is frequently affected;* the pupils "contract

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* Mr. Brodie adduces two cases to prove the obliteration of the memory as to circumstances immediately antecedent to the accident, that produced concussion; and a third from Desault, in which the person, immediately after the blow, had no recollection, except of recent events; but afterwards a change took place, and he could then remember only the events of his childhood. I do not recollect to have witnessed a peculiarity of the last kind, as the result of concussion; but I remember one instance, as the result of disease. A gentleman, aged seventy, who had ever been an

on exposure to light, and are sometimes more contracted than under ordinary circumstances." The pulse, for the first few hours, is feeble and irregular.

Can you easily distinguish between the symptoms of compression and those of concussion of the brain?

139. In the generality of cases it is by no means difficult to do so: but instances may occur, in which the diagnosis may be very difficult, and, in some, next to impossible.

State an example of the last kind.

140. An extreme degree of concussion, accompanied with complete insensibility, which it would be almost impossible to distinguish from a case of compression *without* any marks of external injury.

Is this extreme degree of concussion a common occurrence?

141. Mr. Brodie states it to be a rare occurrence; but that it does occur has been proved by dissection, on which the fatal termination could be assigned to no other cause, but that of violent concussion.—*Med. Chir. Trans.* vol. xiv.

Can you state the best diagnostic symptom of compression?

142. Paralysis, either general or partial.

State also the most conclusive marks of concussion.

143. A disordered state of the intellects, accompanied with vomiting.

Might not the same case develope the symptoms of both compression and concussion at the same time?

144. Certainly; a blow that occasions a compression of the brain may produce a concussion also. For example—vomiting. Sense and motion may co-exist with partial paralysis.

Suppose, from what has been observed, that a case shall occur to you, in which the greatest difficulty of distinguishing the real nature of the symptoms shall prevail—can any inquiry be made that might throw light on the subject, and assist your judgment?

145. Yes; if it could be ascertained that the patient had shown the least degree of sense subsequent to the injury, and had afterwards fallen into a state of insensibility, it would be conclusive in favour of compression.

active and intelligent man, became affected with frequent giddiness, and, from this time, he had no recollection of where he then was, although he had resided in the town for twenty years, or of any event that had occurred within that period; but he retained a perfect remembrance of the events of his early life, and could readily and correctly answer any question that referred to such.

Why is it so important that we should accurately distinguish between compression and concussion?

146. Because the operation that may be indispensable in the one, would be perfectly unjustifiable and useless in the other.

What is the treatment of concussion of the brain?

147. I am not aware that we are in possession of any remedy that has an immediate control over the symptoms of concussion. The chief indication is to prevent or moderate the re-action that usually follows such an injury; and the best method of fulfilling this indication will be that of bleeding generally and topically, of purging and of adopting a strict antiphlogistic regimen. If the vital powers should be too much diminished to allow of such active treatment at first, our conduct must be in the meantime more of a negative kind. We may commence, by causing the head to be shaved, and by applying linen cloths made wet with cold water to the scalp. After this, leeches may be applied to the temples or behind the ears; and as soon as the heart shall have recovered its action, blood should be taken from the arm in a quantity suitable to the state of the patient. Lastly, the head should be raised, the apartment darkened, tranquillity strictly enjoined, and every measure adopted with the view to prevent inflammatory action.*

Genus 5.—*Convulsio.* Convulsion.

Are there any other results consequent upon injuries of the head, that require immediate treatment?

148. In some cases, after an injury of the brain, we find the patient attacked by violent convulsions, affecting the whole person, and very much resembling a fit of epilepsy.—*Brodie on Injuries of the Brain. Med. Chir. Trans.* vol. xiv.

At what time after the infliction of the injury do these convulsions arise?

149. They do not occur immediately upon the accident, as is the case with concussion, but, according to Mr. Brodie,

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* When we observe the spiral turns of the internal carotid and vertebral arteries, previously to their entering the cavity of the cranium, and when we consider that such circumvolutions are made to moderate the heart's action upon the brain, we shall see the necessity of elevating the head and trunk in all cases, where we wish to prevent a determination of blood to the cerebral system.

sometimes they take place a few minutes afterwards; and, at other times, several days may elapse before their occurrence.

From what peculiar injury of the brain does this convulsion arise?

150. Mr. Brodie is of the opinion that this symptom is produced "by pressure on the brain; not, however, by such a degree of pressure as threatens completely to annihilate the function of that organ, but that smaller degree of pressure which operates merely as a source of irritation."

What is the treatment of this kind of convulsion?

151. Bleeding from the jugular vein, and the application of cold wet cloths to the head; a blister to the nape of the neck, purgatives, and a strict antiphlogistic treatment may be tried in the first place; but, should these remedies fail to subdue the convulsions, it will be right to trephine the part injured.

GENUS 6.—*Delirium.*

Is not delirium also sometimes the result of injuries of the head?

152. Yes; "occasionally, after an injury of the head, we find the patient in a state of furious delirium, raving and unmanageable."—*Brodie on Injuries of the Head.—Med. Chir. Trans.* vol. xiv.

What is the supposed exciting cause and treatment of this symptom?

153. Mr. Brodie is disposed to attribute it to a degree of pressure sufficient to produce such a result; and, therefore, advises the same treatment as that recommended for convulsion. And in this case bleeding appears to be attended with *signal good effect.*

CLASS III.—*Spinalia.* Spinal emergencies.

ORDER I.—*Injuriæ.* Injuries of the Spine.

What are the usual results of injuries of the spine?

154. Concussion of the spinal marrow; compression of the cord by the extravasation of blood, or by a displacement of the vertebræ; dislocation of the vertebræ; and fracture of the vertebræ.

Genus 1.—*Concussio medullæ spinalis.* Concussion of the spinal marrow.

What are the symptoms of a concussion of the spinal marrow?

155. "When a person receives a very severe blow upon the spine, or, from any great violence has it very suddenly bent (so as to occasion a concussion), a paralysis of the parts beneath will frequently succeed in a degree proportionable to the violence of the injury; but after such an effect, the person in general gradually recovers the motion and sensation 'of the parts.'"—*Sir Astley Cooper on Dislocations and Fractures of the Joints.*

What is the treatment of spinal concussion?

156. Cupping-glasses or leeches should be immediately applied to the part of the spine that has received the injury, and be repeated, if necessary. A purge should be given, and the antiphlogistic regimen observed. The position of the body should be horizontal; and if the return of nervous energy be retarded, the case should be treated with open blisters and electricity.

Genus 2.—*Compressio medullæ spinalis.* Compression of the spinal cord.

What are the symptoms of a compression of the spinal cord?

157. The symptoms of spinal compression, whether from extravasation or displacement of the vertebræ, are very much the same. They consist of pain of that part of the spine which has sustained the blow, and of a paralytic state of all the nerves that arise below the injury; and they constitute what may be called a traumatic paraplegia.

Are there any diagnostic marks that would distinguish a compression from a concussion of the spinal marrow?

158. None, probably, on the onset of the symptoms; but shortly afterwards we might distinguish the latter by a return of the nervous energy of the paralysed parts; whilst in the former the abolition is usually complete and permanent.

Could you distinguish betwixt a compression of the spinal marrow from an extravasation of blood upon the cord, and that from a displacement of the vertebral column?

159. In the former,* the paralytic effect of the injury may

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* The following case of paraplegia from extravasated fluid, and derived from inflammatory causes, unconnected with external injury, may not be

be more gradual than in the latter, in which the loss of power immediately succeeds the infliction of the injury.

What is the treatment of a compression of the spinal marrow from extravasated blood?

160. General and local bleeding; a purge, low diet, and the horizontal position upon a well-formed and even mattress. The surgeon will do right to adopt also the early use of blisters, and of calomel conjoined with opium.

Genus 3.—*Dislocatio Vertebrarum.* Dislocation of the Vertebræ.

Have you any thing to say on the nature and treatment of a dislocation of the vertebræ?

161. Sir Astley Cooper is unwilling to admit the fact of such a case. He says, "In the numerous instances which

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uninteresting in this place:—A young gentleman, æt. about twenty years, in the summer of 1829, having unguardedly sat in a current of air, whilst in a profuse perspiration, was seized with pain of the right side, accompanied with pyrexia. He was bled, &c. and relieved. Soon afterwards, he complained of pain of the back between the scapulæ, which, in a very few days, terminated in *complete* paraplegia of the lower extremities. The pulse continued frequent; the tongue was furred; he had great thirst, and profuse perspiration; in short the febrile symptoms were very similar to those of acute rheumatism. The belly was costive, and the expelling power of the bladder was lost. The right arm also became painful, and was, in a great measure, paralysed, whilst the left remained very little, if at all, affected. In this stage of the disease I was desired to see him, and, as both general and topical bleeding with blisters, &c. had been previously adopted, I prescribed repeated doses of calomel aad opium, to allay pain, and with the view to cause the absorption of the effused fluid. By this mode of treatment, the sensibility of the lower part of the abdomen and of the upper part of the thighs was perceived to return *in a very slight degree;* but as the case proceeded very slowly and unsatisfactorily, Doctor Gregory, of London, was called in consultation, who was of the same opinion as to the nature and cause of the disease, and made but little change in the treatment. Some time afterwards, as soon as the symptoms of the complaint would permit, he was removed on a litter to his home, near Newbury.

On the eighth of March last, I received a letter from this gentleman, from which, I shall take leave to quote a passage relative to the present state of his health. "My back has been for some time past evidently strengthening, and my thoughts have carried me on to a period, when I may be permitted to attempt sitting in an easy chair. That time has at length arrived. I have been safely placed in a sitting posture, and whilst there, ate my dinner, which I have not done before for more than nineteen months." Paraplegia, from such a cause, I suppose to be a rare occurrence. The circumstance also of one arm being affected, I believe to be unusual; and would lead to the conclusion, that the fluid, as it became effused either upon the theca vertebralis or

I have seen of violence done to the spine, I have never witnessed a separation of one vertebra from another through the intervertebral substance without fracture of the articular processes; or, if those processes remained unbroken, without a fracture through the bodies of the vertebræ."*—*Vide his Work on Dislocations and Fractures.*

Genus 4.—*Fractura Vertebrarum.* Fracture of the Vertebræ.

Can any spinal fracture with displacement occur without having produced paralysis of the nerves below?

162. Yes; the spinous processes may be disjoined from the vertebral arch, without producing permanent paralysis; but hardly without producing more or less of concussion of the spinal marrow.

What are the symptoms of a fracture of the vertebræ at other points accompanied also with displacement?

163. The symptoms of this case are similar to those of a compression of the spinal marrow, as mentioned at 157.

Is there any appearance that could immediately enable you to recognize the case to be that of fracture?

164. I should attentively examine the spinous processes, and should I detect any irregularity in their position at the situation of the injury, I should be led to such a decision.

What would be the result of a rupture of the transverse ligament of the atlas, or of pressure upon the spinal cord above the origin of the phrenic nerves?

165. Instant death.

What is the treatment of fractures of the spine, with displacement and paralysis?

166. Sir Astley Cooper says, "As to the treatment of these cases, I fear, that whatever may be done, the majority of them will prove fatal.

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beneath it, was propelled upwards on one side of the spinal cord. The late Mr. Chevalier mentions in the 3d vol. of the Medico-Chirurg. Trans. page 104, a case of spontaneous extravasation within the theca vertebralis, which appears to me to be of the same nature with that just described, though the result was very different.

* In the 13th vol. of the Medico-Chirurg. Transactions, Mr. Lawrence records a case to prove the possibility of a dislocation of the cervical vertebræ without a fracture. It is right to observe, that Sir A. Cooper does not deny the possibility of such, with reference to the cervical part of the column, as the articulatory processes of the cervical are placed more obliquely than those of the other vertebræ.

"To bring the spine into its natural form by extension will be impossible, if attempted, and it would be scarcely practicable to maintain it in its situation if it could be effected, as the least motion would again displace it." *(Vide his Work on Dislocations, &c.)* Nevertheless, should there be a deformity of the spine, occasioned by the injury, such an attempt ought to be made;* and, after having employed the cupping-glasses, the patient should be placed upon his back on a mattress, and the spine kept at perfect rest, with a view to produce a union of the fracture. To further this object, Mr. Harrold, of Cheshunt, advises the use of a fracture-bed, which will allow the patient to evacuate his bowels without disturbance.

Is not the use of the catheter necessary in cases of paralysis from compression of the spinal marrow?

167. Certainly, in the majority of cases; but sometimes the bladder may be evacuated simply by making pressure on the lower part of the abdomen.†

Can a depression of bone or extravasation of blood upon the spinal cord be removed by any chirurgical operation?

168. Yes; the late Mr. Henry Cline did so in one instance, by means of the trephine; with that case he was unsuccessful in relieving the symptoms, although he removed the posterior part of the vertebral arch. It is to be feared, from the peculiar structure of the spinal column, and from the depth of the bones from the surface, that this operation will never succeed.‡ Sir Astley Cooper emphatically says, "He (Mr. H. Cline) was blamed for making this trial. I am not sure he would have been ultimately successful, but, in a case otherwise without hope, I am certain such an attempt was laudable."—*Ibid.*

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* This was successfully done by Dessault in a case of dislocation of the cervical vertebræ.—*Cooper's Dictionary of Practical Surgery,*—Article, Dislocation.

† In the last case that came under my care, in which the injury was situated in the lower cervical vertebræ, I found that by making pressure upon the pubic region, I could empty the bladder in full stream with great ease. This plan, therefore, might always be tried previously to the introduction of the catheter; as it might be the means of saving the surgeon (especially in a country practice) much trouble and fatigue.

‡ Every remedy, hitherto adopted in spinal compression, has but too constantly failed. "The period of existence (says Sir A. Cooper) is short or protracted as the injury is near or distant from the cervical vertebræ, and as the displacement is slight or considerable; and will depend also upon the degree of injury the spinal marrow has sustained.

CLASS IV.—*Facialia.* Facial Emergencies.

ORDER I.—*Vulnera propria.* Wounds proper to the Face.

GENUS 1.—*Divisio Palpebrarum.* Splitting of the Eyelids.

How would you treat a case in which the eyelid is split asunder?

169. By suture and adhesive plaister. The stitches should be made with a fine needle, and passed only through the skin and cellular membrane. The greatest care should be taken to bring the edges of the tarsi accurately together in their natural position, otherwise there may be subsequent deformity, than which nothing would be more distressing to the patient, or a greater eye-sore to the surgeon. After the wound has been dressed, the eyelids should be kept closed till union has taken place.

GENUS 2.—*Abruptio tendinis orbicularis Palpebrarum.* Rupture of the tendon of the orbicularis Palpebrarum.

What is the treatment of a rupture and displacement of the tendon of this muscle?

170. The tendon should be restored to its natural position, and retained there by suture, made with a very fine needle, and by adhesive plaister. As in the above case, the eyelids should be kept closed, in order that re-union may not be disturbed.*

GENUS 3.—*Vulnus ductûs parotidei.* Wound of the parotid duct.

State the precise situation of the parotid duct as it passes across the cheek.

171. The parotid duct, in passing across the face, lies at a point measuring one-third from the zygoma of the temporal bone, and two-thirds from the base of the lower jaw.

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* I have seen one case of this kind, in which the upper tendon was torn out by the point of a cow's horn. The above treatment completely succeeded, and left no deformity or inconvenience whatever. I shall not in this Work make mention of wounds of the eye and orbit, further than that they must be treated upon general principles; but as the floor of the skull over the orbit is extremely thin, the lancet must not be spared, and the antiphlogistic regimen must be strictly enforced. For more particulars on this subject, the reader is referred to the Works of Doctor Hennen, Doctor Thomson, &c.

Suppose the duct to be severed by an incised wound, in what manner would you treat the case?

172. By bringing the margins together, as in other incised wounds; but in this case, in which our chief object is to restore the integrity of the duct, we should be careful that the *entire sides* of the wound be brought into close contact; and this will be best effected by the quill-suture.

Genus 4.—*Divisio Labii.* Lip-split.

State the treatment of this species of wound.

173. The edges of the wound may be brought together and kept in contact either by common suture, or by the hare-lip pins and twisted suture, according to the exigency of the case. The external dressing should consist of adhesive plaister. The food should be fluid, until union has taken place.

Genus 5.—*Vulnus Linguæ.* Wound of the Tongue.

Should you be called to a case, in which the tongue was partly divided, what treatment would you adopt?

174. Wounds of this kind are to be treated upon general principles; but they admit of the use of sutures only. In severe wounds of the tongue, the almost absolute rest of the organ is positively necessary, and to effect this as much as possible, the patient ought to be kept silent, and fed with the spout of a tea-pot or syringe.

If the raninal artery be wounded, by what method would you restrain the hemorrhage?

175. The mouth being held wide open, and the tongue drawn forwards and upwards as far as possible, the vessel should be secured by ligature by means of Asalini's Tenaculum, or by the dip of a fine curved needle.*

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* This wound usually occurs to new-born infants in the lower ranks of life by the officiousness of old nurses, who suppose that nine-tenths of the children, born into the world, are tongue-tied. The case is of course submitted to the sagacity of the midwife, who, long before the poor child is made to open its mouth, decides in the affirmative, and, without hesitation or any idea of danger, makes a hideous gash beneath the tongue with (fortunately) a pair of blunt ill-cutting scissors, or the artery would be divided more frequently than it is. This absurd practice cannot be too much deprecated; for the more probable truth is, that the proportion of children born really tongue-tied, is as one to five thousand.

Should the life of the patient be endangered by profuse hemorrhage, from a deep wound of the tongue, and should it be impracticable to take up the bleeding arteries, what other means would you employ?

176. In such a desperate case, I should not hesitate to apply the actual cautery, or tie the common carotid artery.*

GENUS 6.—*Vulnus arteriæ maxillaris externæ.* Wound of the external maxillary artery.

What are the best means of restraining hemorrhage from this artery?

177. Hemorrhage from this vessel or from the temporal artery, may be restrained by ligature, or by compress and bandage. The external maxillary artery may be conveniently compressed upon the lower-jaw, as it passes the under and fore part of the masseter muscle.

GENUS 7.—*Vulnus art. alveolaris.* Wound of the alveolar artery.

What is the usual cause of hemorrhage from this artery?

178. The extraction of a tooth will sometimes lacerate a branch of this artery,† and in hemorrhagic habits occasion profuse and dangerous bleeding.‡

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* This was successfully done by Mr. Collier, Surgeon to the Forces, with complete success.—*Vide Med. Chi. Trans.* vol. vii. page 107.

† Profuse hemorrhage after the extraction of teeth is not uncommon. One case of this kind, that occurred in my own practice, I will briefly relate. A. S., a gardener, ætat. about fifty years, after the extraction of one of his molar teeth, returned to his home, four miles distant. The tooth had been drawn without any difficulty, and the bleeding not being more profuse than under common circumstances, there was no reason to suppose it would continue beyond the usual limit. However, eight hours afterwards, he returned in consequence of the hemorrhage having continued without any cessation, and in such a state of exhaustion, that as soon as he reached my house he fell down in a fainting-fit. His countenance appeared as if in articulo mortis; the pulse was not perceptible at the wrist; and this state of extreme syncope lasted so long as to be truly alarming. Many stimulants were tried without the slightest benefit, till at length, by the application of the strongest solution of ammonia to the nostrils, he recovered; and the hemorrhage never returned. In this case, had the bleeding returned, the result would probably have been fatal.

‡ I have seen one instance of spontaneous hemorrhage from the mucous membrane covering the external gums of the lower jaw. It occurred to a person more than fifty-five years of age, who had long been in the habit

You say a dangerous bleeding—Has it ever been attended with fatal results?

179. In the 8th vol. of the Med. Chir. Trans., a case of this kind is recorded by Mr. Blagden, which terminated fatally, in spite of every effort made by Mr. Brodie to restrain the hemorrhage; who at length, as a derniere ressource, tied the trunk of the external carotid artery, but in vain.

Can you suggest any local mode of treatment, that would probably restrain this bleeding in habits strictly hemorrhagic?

180. Having reflected upon the best method of treating a case of this kind, that may resist the ordinary means, I would suggest the following:—Mould a small piece of elastic gum into a conical form, that shall accurately plug the cavity from which the tooth has been extracted. Having introduced this plug, let constant pressure be made upon it by the obtuse point of a stout piece of iron wire, bent at right angles about three-quarters of an inch from the point. This pressure may be kept up by an assistant as long as may be deemed necessary. Should this mode fail, the plug may be removed, and pressure made by the point of the wire alone upon the vessel till the bleeding stops. In the event of this proving unavailing, it may be heated and used as a cautery.

Do you think that the cautery itself would ultimately succeed in habits so disposed to hemorrhage?

181. I fear not; for on the separation of the sloughs, the wound will probably bleed again.

GENUS 8.—*Vulnus arter. nasalium internarum.* Wound of the internal nasal arteries.

From what vessel are the internal nasal arteries principally derived?

182. Principally from the internal maxillary artery, which is a branch of the external carotid.

What is the most common cause of hemorrhage from these arteries?

183. The extraction of polypi.

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of excessive drinking, and who had drank to great excess the night previously. The hemorrhage sprang in full stream from a branch of the inferior maxillary artery, so that a considerable quantity of blood was lost before I saw the case. The bleeding was restrained by the application of the lunar caustic, a strong aluminous lotion, and by a brisk purge.

Suppose the hemorrhage to be so profuse as to endanger the life of the patient, what means have you of checking it?

184. First. Ice-cold water may be applied to the face generally, and sniffed up the nostril; or it may be also applied to the back of the neck and genitals.

Secondly. Should the above method fail, I should "roll a considerable piece of lint as fast as possible round the extremity of a probe; wet it completely through with a strong solution of the sulphate of zinc; introduce it into the nostrils, and press it as strongly as I could against the part whence the blood issues. When the nostril is very much dilated, the fingers may be used for this purpose with more advantage than the probe. The point from which the blood is effused may easily be ascertained by pressing the finger on various points. As soon as the blood ceases to flow, we may conclude that the finger is on the situation of the hemorrhage."—*Cooper's Dictionary of Practical Surgery.*

Lastly. To preserve the life of the patient, we have the means of plugging the nostrils; and it may be done in the following manner:—"A piece of wire (a catheter-wire for example) made with an eye, to convey a double ligature, is thrust into the nostril until it appears in the throat; to facilitate which, it ought to be curved near the end that it may turn down behind the velum; then, with a pair of forceps, or a hook, or the finger, this ligature is seized and drawn into the mouth. Having prepared a piece of sponge, or a dossil of lint, such as will just plug up the posterior opening of the nostril, we tie this to the ligature, and draw it through the mouth into the back of the nose; then, closing the anterior nostril by plugging it also, and tying the ends of the ligature over the plug, no blood can escape."—*Bell's Operative Surgery.*

ORDER II.—*Fracturæ.* Fractures.

GENUS 1.—*Fractura ossium nasalium.* Fracture of the nasal bones.

Is a fracture of the ossa nasi ever attended with dangerous results?

185. Yes; a fracture of these bones may produce concussion of the brain, and if attended with displacement and depression, it may drive the crista galli upwards, and occasion still more serious cerebral injury.

What is the treatment of a fracture of this kind, unconnected with cerebral symptoms?

186. Should there be a displacement of the bones, which usually occurs, the fragments must be restored to their natural situation by the finger, the handle of a tea-spoon, a probe, or such means, and retained there by some unirritating support within, and cross straps of adhesive plaister without.

Suppose this injury had produced vomiting, what inference would you draw as to the effect of the injury?

187. That the violence of the blow had occasioned a concussion of the brain.

Again: Suppose the blow had occasioned a depression of the nasal arch, accompanied with an abolition of sense and motion, with stertorous breathing, what effect would you conclude had been produced upon the brain?

188. A compression of the organ by the displacement upwards of the crista galli of the ethmoid bone.

State the treatment of these effects as connected with a fracture of the ossa nasi.

189. The treatment of concussion should be the same as that recommended at 147, and should the symptoms of compression arise from the crista galli and nasal lamella being driven upon the brain, the depressed nasal bones must be raised, and we must endeavour to draw gently forwards the perpendicular process of the os ethmoides, which is connected with the cribiform lamella and crista galli. "Perhaps a pair of closed common forceps, introduced into each nostril, might best enable the surgeon to do what is necessary. Bleeding and the antiphlogistic regimen are always proper."*—*Cooper's Dictionary of Practical Surgery.*

Genus 2.—*Fractura ossis maxillæ inferioris.* Fracture of the lower jaw.

Describe the most usual fractures of this bone.

190. "The bone is liable to be broken either in its body, or

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* I recollect an instance, in which the cartilaginous part of the nose was completely severed from the ossa nasi by a fall from a hay-loft upon a flint pavement. The accident occurred in the night during a state of intoxication, when the patient, who was the clerk of the parish, emphatically declared to his companion that he had got two noses. In the morning he presented a hideous appearance, but by means of a few stitches and adhesive plaister, the parts were reunited without any deformity remaining, to the great and lasting delight of the clerk.

rami; either one side or both: it may also be fractured near its symphysis; and the injury may, in some instances, be only mere solutions of continuity: while, in others, they may be comminuted fractures, that is, cases in which the bone is broken into several pieces. Fractures of the lower jaw are usually not at all displaced, when these injuries occur near the angle of the bone; for then the pterygoid, temporal, and masseter muscles, retaining the posterior part, the digastric and other muscles cannot draw downward the body of the bone."—*Cooper's First Lines, small edition.*

Were you called to a simple fracture of the lower jaw, without any displacement of the bone, how would you detect it?

191. "By introducing a finger into the mouth and pressing on the front teeth of the side, on which the fracture is supposed to be, while at the same time the fingers of the other hand are applied to the basis of the bone near the angle. On making alternate pressure on each of the above situations, the bone may be felt to move, or even a crepitus may be distinguished."—*Ibid.*

What is the treatment of a simple fracture of the lower jaw, without displacement?

192. "The surgeon should adapt some thick pasteboard, previously wet and softened with vinegar, to the outside of the bone, both along its side and under its base; over this moistened pasteboard a bandage, with four tails, is to be applied, the centre being placed on the patient's chin, while the two posterior tails are to be pinned to the front part of the night cap, and the two anterior ones fastened to the part of the same cap more backward. When the pasteboard becomes dry, it forms the most convenient apparatus imaginable for surrounding and supporting the fracture."—*Cooper's Dictionary of Practical Surgery.*

State the most common displacements of this bone when fractured.

193. "Fractures of the lower jaw are subject to displacement in the following way:—When the fracture is near the symphysis, the side on which the processus innominatus is situated, is drawn downward and backward by the submaxillary muscles, while the other fragment is supported by the muscles which close the jaw. When the fracture is more backward, the displacement occurs in the same way, but not so easily. When the bone is fractured in two places, the middle portion is always pulled downwards and backwards by the muscles attached to the chin, while the two lateral pieces are kept up by the levator

muscles. When the ramus of the jaw is broken, the masseter, being attached to both pieces, prevents any considerable degree of displacement. When the neck of the condyle is fractured, the pterygoideus externus may pull the condyle forward."—*Ibid.*

In what manner would you restore the displacement to its natural position?

194. "By pushing the displaced part upward and a little forward, and pressing on the basis of the bone, so as to bring it exactly on a level with the portion, which has preserved its natural position; indeed, the correctness of the reduction can always be rightly judged of by attending to the line which the base of the jaw ought to form, and observing that the arch of the teeth is as regular as nature will allow."—*Ibid.*

Would a compound fracture require any different treatment?

195. None, except with reference to the wound. The fracture having been reduced in the manner above mentioned, the wound is to be closed and covered with adhesive plaister.

Having reduced the displacement of the fracture, in what way would you maintain the reduction?

196. "The maintenance of the reduction is difficult, and can only be well executed by supporting the lower jaw and keeping it applied to the upper one; as the latter indication cannot be properly fulfilled in persons whose teeth are very irregular, it is sometimes necessary to interpose an even piece of cork between the teeth on each side of the mouth, and against this cork the lower jaw is to be kept up with the bandage" above mentioned, "while the aperture left between the incisors, in the situation where no cork is placed, allows food and medicines to be introduced with a small spoon. In order to keep the middle portion of the bone from being drawn downwards and backwards towards the larynx, it is frequently necessary to apply tolerably thick compresses just under and behind the chin, which are to be well supported by the bandage already described."—*Ibid.*

Should the fracture be situated just below the condyle, in what manner would you bring the fractured ends of the bone in contact?

197. "When the condyle is fractured, as it is instantly drawn forward by the action of the pterygoideus externus, and on account of its deep situation, cannot be pressed back, the lower portion must, if possible, be pushed into contact with it. For this purpose the bandage must be made to operate particularly on the angle of the jaw, where a thick compress should be placed."—*Ibid.*

If any of the teeth were dislodged from their sockets, would you replace them?

198. Assuredly—except at the point of the fracture.—*Cooper's First Lines.*

Should there be profuse bleeding from the inferior maxillary artery, would you endeavour to secure it, previously to the reduction of the fracture?

199. Certainly not; as it might interfere with the union of the bone—besides, the accurate replacement of the fractured ends of the bones always stops the hemorrhage.—*Ibid.*

What instructions would you leave for the observance of the patient?

200. That the jaw should be kept without the slightest motion; that he should not attempt to speak, and that his food should consist of fluids only. In a very bad comminuted fracture, the food may be conveyed into the œsophagus through a hollow gum-elastic tube.

ORDER III.—*Dislocatio.* Dislocation.

GENUS I.—*Dislocatio maxillæ inferioris.* Dislocation of the lower jaw.

What is the appearance of a person, whose inferior maxilla is dislocated?

201. The patient will be found with his mouth extremely wide open, and in severe cases incapable of moving the dislocated jaw, which will be thrust downwards and forwards. The cheeks will be made prominent by the projection of the condyloid processes, and the sides of the face anterior to the meatus auditorius, flattened by the absence of those processes. There will be also the expression of great pain, and a constant dribbling of saliva.

What would be the difference in appearance when the laxation is partial or only on one side?

202. "In this case the condyloid process advances under the zygomatic, and on one side only, producing an incapacity to close the mouth; but it is not so widely opened as in the complete dislocation. It is easy to distinguish this accident by the chin being thrown to the opposite side to the luxation; and the incisores teeth are not only advanced upon the lower jaw, but are no longer in a line with the axis of the face."—*Sir Astley Cooper on Dislocations and Fractures of the Joints.*

What is the cause of a complete dislocation of the lower jaw?

203. This accident is caused by the jaw being forced open beyond its natural limits, by which the condyloid processes slip over the articular eminences beneath the zygomatic arches.

By what cause is the partial laxation of the jaw generally occasioned?

204. "The cause of this accident is a blow on the side of the face, when the mouth is open."—*Ibid.*

In what manner would you reduce a complete dislocation of the jaw?

205. Having wrapped handkerchiefs round my thumbs, I should place them on the molares of each side, at the root of the coronoid processes; and, grasping the bone, I should use sufficient force to depress the condyles downwards and backwards, till they have cleared the articulary eminences over which they had slipped, when the levator muscles will instantly jerk them into their natural cavities.

If this method were not to succeed, what other would you try?

Sir Astley Cooper recommends two corks to be placed behind the molares teeth on each side of the mouth, and the chin to be raised, so that the jaw may act as a lever upon them, and thereby depress its condyles beneath the zygomatic eminences.—*Vide his Work on Dislocations, &c.*

The late Mr. Fox, the celebrated dentist, pursued a third method:—he placed the end of a wooden lever about a foot long betwixt the molares teeth, and elevated the end he held in his hand, till the bone was depressed and reduced. This he did first on one side and then on the other.—*Ibid.*

In what kinds of luxation has each of these modes the preference?

207. In recent luxations, the jaw may be reduced by the hands alone; in cases of longer standing, and in maniacs, Sir Astley Cooper's mode is to be preferred; and in partial laxations, Mr. Fox's plan ought always to be employed.

What remains to be done after the luxation has been reduced?

208. To support the jaw by the four-tailed bandage, recommended in fractures of this bone, and to warn the patient against opening his mouth widely, until the lacerated parts have healed.

CLASS V.—*Jugularia.* Jugular Emergencies.

ORDER I.—*Asphyxia.* Suspended Animation.

GENUS 1.—*Suffocatio ab Immersione.* Suffocation by Drowning.

What are the first steps to be taken as soon as the body of the drowned is landed?

209. I find the following instructions in the Annual Report of the Royal Humane Society.

" Cleanse the mouth and nostrils.

" Strip, dry, and reclothe the body with all possible despatch, or put it into blankets: do this on the spot, unless a convenient place be near at hand, in which case, convey it, before you strip the body, to such suitable spot."

" Place it on the back of a table, if there be one of a convenient height, covered with blankets. Raise the head, shoulders, and chest, and support them in that position. Wrap the body, as soon as possible, in warm blankets."—*Annual Report of the Royal Humane Society.*

Of what means does the resuscitative process consist?

210. The restoring means are,

1. Artificial respiration.
2. Heat.
3. Friction.
4. Stimulants.
5. Bleeding in some particular cases. *Ibid.*

Which of the two first remedies ought to take the precedence?

211. " Artificial warmth and artificial respiration should be simultaneously employed."—*Ibid.*

How many persons are necessary to employ the means for artificial respiration?

212. Two intelligent persons may attempt the operation.

Should there be no regular apparatus at hand, what means might be effectually substituted?

213. " The substitutes are a pair of common bellows, a boxwood tube, or wine strainer, or horn, or conical tube of stiff paper or leather."—*Ibid.* Or the bellows alone may be sufficient.

Describe the method of employing such.

214. " The subject being placed in as advantageous a situa-

tion as circumstances will permit, the bellows should be applied to one nostril, while the other nostril and the mouth are kept closed, and the lower end of the prominent part of the windpipe is pressed backward and a little downward. The bellows are to be worked to this situation; and when the chest is swelled by it, the bellows should stop, the pressure should be removed from the nostril, and an assistant should press upon the chest so as to expel the air. The bellows should then be applied as before, the nostril again closed, and the chest again pressed. This process should be repeated from fifteen to twenty times in a minute, so as to imitate natural breathing as nearly as possible."—*Ibid.*

Explain the reasons for shutting the nostril unoccupied by the nozzle of the bellows, for closing the mouth, and for pressing backward the lower part of the cartilaginous prominence of the wind-pipe.

215. These things are done to compel the air, forced in by the bellows, to rush into the lungs; for if the mouth and nostril were not closed, the air would return through these openings; and if the œsophagus were not pressed back against the bodies of the vertebræ, a part of the air would go down the alimentary canal.

You have not mentioned the use of the tubes, that were recommended to be employed with the common bellows.

216. If such a tube, as either of those above-mentioned, be at hand, it ought to be inserted into the nostril, for the more effectual working of the bellows, the nozzle of which may be accurately fitted into its cavity by a strip of linen, ribbon, or tape (*Vide Dr. Curry's Observations on Apparent Death*)—but I repeat that, in the absence of such, the bellows should be tried alone rather than that we should delay the operation.

Should you possess a case of instruments adapted to this purpose, describe the mode of employing such.

117. Possessed of such an advantage, we may immediately proceed to inflate the lungs either through the nostril, the larynx, or the trachea, by the introduction of a tube well adapted for each passage, and by the use of a pair of bellows, the nozzle of which accurately fits into the outward opening of each tube.

You say through the trachea—by what opening?

218. Through an opening made by the operation of bronchotomy; for should there be either difficulty or delay in adopting the other methods, we shall be perfectly justified in performing this operation for inflating the lungs.

How long ought the artificial respiration to be continued?

219. Doctor Curry advises the operation "to be repeated in a regular and steady manner, until this and the other measures recommended have been persisted in for at least six hours without any appearance of returning life."—*Dr. Curry's Obs. on Apparent Death.*

Describe the manner in which heat should be communicated to the body?

220. While some assistants are engaged with artificial respiration, "others should be employed in communicating continual heat to the body. Dry warm blankets, bags of warm grains, or sand, bladders, or bottles of water, or hot bricks, or blankets wrung out of hot water, are amongst the means most easily obtained. The body may be placed before the fire, or in the sunshine, if strong at the time. Whatever may be the means employed, the restoration of warmth should always be assiduously pursued. Should the accident happen in the neighbourhood of a steam-engine, brew-house, bake-house, or any fabric where warm water can be easily procured, it would be of great importance to place the body in a warm bath, moderated to a degree of heat not exceeding one hundred degrees. The warmth most promising of success is that of a heated bed or blankets. Bottles of hot water should be laid at the bottom of the feet, to the joints of the knees, and under the arm-pits; and a warming-pan, moderately heated, or hot bricks wrapped in cloths, should be passed over the body, and particularly in the direction of the spine. A large bladder should be applied, filled with hot water, and inclosed in flannel, to the region of the stomach and heart. The natural and kindly warmth of a healthy person, lying by the side of the body, has been found, in some cases of adults, and particularly of children, very efficacious; but the warm bath, where it can be procured, is preferable to all other means of communicating heat."—*Annual Report of the Royal Humane Society.*

When, and in what manner, ought friction to be employed?

221. "Friction should at first be used as a means of increasing warmth; and subsequently, when the lungs have been successfully inflated for some time, as a means of assisting the circulation of the blood. Gentle friction with a warm hand is the most likely to accomplish both these ends."—*Ibid.*

When ought stimulants to be used, what kind, and in what manner?

222. "These means are applied on the supposition that the vital powers exist, and are in a state to be called into action.

They may be applied to all the organs of sense and to the throat and intestines. To the eye apply a strong light, at intervals, for several minutes; a sharp shrill sound from a horn or trumpet may be thrown at intervals into the ear. Irritation given to the nose has considerable influence in exciting the action concerned in respiration; for this purpose the nostrils may be occasionally touched with a feather dipped in spirits of hartshorn, aromatic spirit of vinegar, &c. During life the skin loses sensibility in proportion as it is deprived of heat, and does not recover it again, until the natural degree of warmth be restored. Previous to the restoration of heat, therefore, to a drowned person, all stimulating applications are useless; and, so far as they interfere with other measures, are also prejudicial. The skin having in some degree recovered its sensibility, spirit of hartshorn, or eau de luce, or a liniment of equal parts of spirits of hartshorn and salad oil, may be rubbed on the wrists, ancles, temples, and parts opposite the stomach and heart. Introduce some moderately warm and stimulating liquor into the stomach by means of a syringe and flexible tube, such as half a pint of warm negus, or water with spirits of hartshorn, mustard, or essence of peppermint. Till the power of swallowing is pretty well restored, it will be dangerous to attempt getting spirits down the throat in any other way. The best time to administer a stimulating cordial of the above kind is a few minutes after the other part of the process is begun. A clyster of a pint or more of water, moderately warmed, with the addition of the materials before mentioned, or of rum, brandy, or gin, may be administered."—*Ibid.*

To what extent ought venesection to be carried?

223. "Bleeding in suspended animation requires the utmost caution. In such cases the right side of the heart and the venous system will often be gorged with blood, and the abstraction of a small quantity from the external jugular vein may relieve the brain and contribute to the restoration of life. The quantity, however, necessary for accomplishing this purpose, should not exceed from an ounce to four ounces; as it is evident that great danger of extinguishing vitality would be incurred by abstracting much in a case of suspended vital action."—*Ibid.*

"In all instances the intelligent practitioner should be guided by the particular circumstances of each individual case; and whilst he should relieve any obvious turgescence, or preternatural distension of any important organ, he should be sparing in exhausting the already diminished powers of the system by a greater loss of blood than the necessity of the particular case may require."*—*Ibid.*

* With a view to assist the memory, I have ventured, though imperfectly, to transcribe into verse the means to be adopted for the recovery of the drowned.

Fluctibus exaltis sublato corpore, vestes
  Eripe funereas, et properante manu.
Emunda nares faucesque, ut limina vitæ
  Œthera vivificum, rursus aperta, bibant.
Desiccaque cutem, et villoso contege panno,
  Tegmine sive aliquo, quod dare possit opem.
Talia si careant, perituro reddere vitam
  Denudare humeros te juvet usque tuos.
Pone super tabulâ corpus, colloque levato,
  I pete subsidium finitimumque domum.
Nunc tibi judicium valeant, tentamen et ordo,
  Ne mala res meritum cedere ducat opus.
Haud mora pulmones ignavos follibus infla,
  Ut scintilla flagret, quæ sine morte manet;
Namque loco occulto "lateat scintilula forsan"
  Plena spei, et vitæ lucida signa tenens.
Membra frica manibus, fotu præcordia cinge,
  Cursibus ut solitis flumina pigra fluant;
Injice perque gulam, generosi pocula vini,
  Ventriculum paritèr molle calore frui.
Denique si liceat jugularem scindere venam
  Pervigila! dubium tempore cesset opus;
Ne nimium cordis traheres e fonte, manusque,
  Quæ dare vult vitam, causa sit usque necis.
Sic persta flamen fugiens revocare—Labora
  Fortibus et remis vincere mortis aquas;
Sic persta—donec lumen vitale refulget,
  Vel scintilla fugit, vitaque spesque cadunt.

Imitation in English Verse.

When the cold corse shall have been brought to land,
Strip off its clothes with an industrious hand;
Cleanse well the mouth, th' obstructed nostrils clear,
And let each passage drink the vital air.
Wipe dry the body, wrap a blanket round,
Or some such covering as can best be found—
Nay—lend thy coat—'tis sweet a life to save,
And snatch a brother from a wat'ry grave.
Then on a plank, with head and shoulders high,
Convey the body to some cottage nigh.
  Now let good order and good sense prevail,
And no confusion make thine efforts fail.

What is the treatment to be adopted after recovery?

224. The greatest possible care is required to maintain the restored actions; so as on the one hand to avoid excitement, or on the other to prevent their cessation. If suicide has been attempted and thus happily prevented, we cannot but impress the necessity of the most guarded conduct."—*Ibid.*

State the means which the Royal Humane Society has rejected as baneful.

225. Holding up by the heels.
Rolling on casks.
Emetics.
Friction with salt or spirits.
Tobacco in every shape.

GENUS 2.—*Suffocatio a suspensione.* Suffocation by suspension.

What is the treatment of this kind of asphyxia.

226. 1. The ligature should be removed from the neck.
2. The head and trunk should be raised higher than was recommended in the case of the drowned.
3. The same measures, recommended for drowned persons, are also necessary in these cases. Vide 209 to 222.
4. Bleeding will be necessary.*

With common air the breathless lungs inspire;
Blow the faint sparks of unextinguish'd fire;
(For yet perhaps some embers may remain
Ready to kindle into life again);
Rub well each limb; a genial warmth impart
Around the stagnant regions of the heart;
Then down the gastric tube a cordial throw—
Some draught to make th' internal organs glow:
Should thy best judgment pierce the jug'lar vein,
Take heed! in *time* the vital stream restrain,
Lest thou too much from nature's fountain pour,
And so destroy the life thou wouldst restore.
Thus on proceed to rouse the dormant breath;
Ply the strong oar and struggle hard with death;
Nor cease thy toil, till life's bright flame return,
Or till the lamp at length refuse to burn.

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* In addition to these means, Doctor Curry recommends the use of electricity where it can be performed.

From what vessel would you abstract blood; and what quantity ought to be taken away?

227. "The jugular vein is recommended to be opened rather than a vein in the arm. The quantity of blood to be abstracted must be enough to unload and relieve the vessels of the head without weakening the powers of life."—*Annual Report, &c.*

GENUS 3.—*Suffocatio ab æthere noxio.* Suffocation by noxious air.

What are the gases that most commonly destroy persons in this way?

228. "All gases wanting admixture of oxygen are totally unfit for respiration; and no gas is properly qualified for the due and natural performance of this important function, but atmospheric air. Carbonic acid gas, the product of respiration, of combustion, of burning charcoal, of fermentation, and found in abundance in caverns, mines, wells, brewers' vats, &c." is the most common cause of this kind of asphyxy.—*Ibid.*

State the treatment of this kind of suffocation.

229. "The body should be naked, laid in the open air, with the head and shoulders considerably raised; cold water should be dashed smartly and repeatedly on the head, neck, and breast, &c. until the temperature of the body be reduced to its natural standard, or until signs of life appear. If the body, however, be under the natural temperature, then it will be necessary to apply heat. In the meantime, the measures recommended for the drowned must be adopted. Vide 209 to 222. Bleeding may be sometimes requisite.* A brisk purgative or emetic will remove the violent pain in the stomach which sometimes occurs after recovery."—*Ibid.*

GENUS 4.—*Suffocatio a compressione.* Suffocation by smothering.

What is the ordinary cause of persons being smothered?

230. This kind of asphyxia occurs generally to infants, and is usually occasioned by their being overlaid by their nurses.

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* A very interesting paper on this subject will be found in the Medico-Chirurg. Transactions, by Dr. Babington, vol. 1, page 83, in which it appears that galvanism was beneficial, and bleeding prejudicial to the patient.

What treatment ought to be adopted for their recovery?

231. If the body be warmer than natural, reduce the temperature. Inflate the lungs, and adopt the means recommended for the recovery of the drowned. Vide 209 to 222.

GENUS 5.—*Suffocatio infantum in partu.* Suffocation of new-born infants.

What is the most frequent cause of the asphyxia of new-born infants?

232. This kind of asphyxia is usually occasioned by the funis being tightly coiled around the neck of the child.

What would be your treatment of such a case?

233. In the first place, should our attempts to loosen the funis be unavailing, the cord should immediately be divided by a stroke of the scissors, made between the knots of a double ligature, which should be tied at the most convenient point of the coil.

By what means would you attempt to restore animation?

234. By inflating the lungs; by the application of warm flannels; by putting the body into a warm bath; by moderate frictions upon the chest with the naked hand; by gentle agitations; and by stimulants to the nose, temples, and pit of the stomach."—*Annual Report of the Royal Humane Society.*

ORDER II.—*Obstructio trachealis.* Tracheal obstruction.

GENUS I.—*Dyspnœa a tumoribus.* Dyspnœa from swellings.

What is the nature of those swellings and tumours, which, by their pressure upon the upper part of the respiratory canal, threaten to obstruct the trachea and produce suffocation?

235. They may consist of inflammatory swellings, which by their rapid increase may threaten speedily to suffocate the patient; or of chronic tumours, which are slow in their progress, but from their situation are generally more unmanageable, and therefore more fatal in their results.

At what part are the phlegmonous swellings usually situated that endanger this canal?

236. Such swellings may take place at any point in or about the larynx or trachea; but the respiratory canal is most frequently threatened by tumefaction and inflammation of the mucous membrane of the larynx, and by the enlargement and

suppuration of the tonsil glands, constituting the disease, called the cynanche tonsillaris, which is the quinsy of the ancients.*

At what part of the neck do you usually find the chronic or sarcomatous tumours, that obstruct the trachea?

237. These are more commonly situated in the anterior and lateral parts of the neck.

Does the enlargement of the thyroid gland ever become the cause of suffocation?

238. Good, in his chirurgical works, declares that he never knew life to be endangered by this sort of tumour; and I believe that this opinion is very much in accordance with the experience of the present day. It cannot however be denied that "the pressure of a large bronchocele may not only greatly afflict the patient by rendering respiration difficult, but actually cause death by suffocation."†—*Mr. Cooper's Dictionary of Practical Surgery.*

Can you explain why the enlargement of this gland so little affects the respiration?

239. The integuments, opposing the growth of the gland much less than the cartilaginous texture of the trachea, the tumour projects anteriorly without causing any material pressure upon the tube.

If suffocation were threatened by suppuration of the tonsil glands, what treatment would you adopt to prevent it?

240. The matter should be instantly evacuated by the blade of a lancet, kept straight with its handle by means of waxed thread or tape—or a penknife would answer the same purpose, if the former instrument were wanting.

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* It must be acknowledged that now persons very rarely, if ever, fall a sacrifice to this kind of cynanche, although in its progress it is sometimes truly alarming; and as this result of the disease is so different from what is recorded of it in ancient writers, we are led to infer that it has happily lost that degree of severity, with which it was characterized in those days. It was so formidable in the time of Sydenham that he hands down the fatal termination of the quinsy in these words—"Ingens ab hoc morbo periculum, ut pote qui paucis nonnunquam horis hominem jugulat; quoties scilicet magna vis materiæ febrilis in prædictas partes conjicitur, neque satis tempestivè convenientium renediorum usu, ingruente occurritur procellæ."—*Opera Universa Thomæ Sydenham.*

† I have met with one case, in which this gland was in a state of complete stony scirrhosity, but the respiration was not at all impeded by it, as it had not very much increased in size.

Should the same result be threatened by a deep-seated abscess amongst the muscles of the anterior and lateral part of the neck, how would you snatch the patient from his perilous situation?

241. By plunging a lancet into the abscess, however deep it may be situated; at the same time, taking care not to wound any of the important parts of the neck.*

Again: Should you be called to a patient labouring and struggling for breath from inflammation of the mucous membrane of the larynx, every other means having been employed in vain—what decisive measure would you adopt for his relief?

242. I should immediately resort to the operation of bronchotomy.‡

Should the trachea or larynx be obstructed by the pressure of a sarcomatous tumour, and the respiration thereby endangered, what treatment would you adopt for the relief of the patient?

243. Much would depend upon the practicability of removing the tumor, and upon the state of the respiration. If the tumour should allow of excision, it ought to be removed immediately; but if the respiration be too oppressed to admit of the delay, bronchotomy ought first to be performed.

But might not the respiration in such cases be as soon relieved by the removal of the tumour as by bronchotomy?

244. Certainly not. For example, suppose a surgeon were called into the country to a distressing case of this kind, in which the patient was struggling for breath—having no assistant, he would hardly venture to remove the tumour; but he would not hesitate to open the trachea or the larynx even with a penknife.

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* I will here relate a case of this kind, that occurred to a child twelve years of age. This little girl first complained of pain and stiffness of the left side of the neck, which threw the head on the opposite side. These symptoms were soon followed by a deep-seated swelling and abscess, which, instead of pointing externally behind the sterno-mastoideus muscle, extended itself towards the trachea, and threatened her life by suffocation. A lancet was plunged deep into the abscess, behind the posterior margin of the muscle, which gave vent to four ounces of matter, and immediately relieved the respiration.

‡ This mode of treatment is now not unfrequently adopted, and that with a considerable share of success. In the 6th vol. of the Medico-Chirurgical Transactions, page 151, the late Mr. Chevalier mentions an interesting and successful case of bronchotomy, performed to relieve suffocation from an accumulation of coagulable lymph, in cynanche laryngea. The same treatment is recommended by Marshall Hall in the 12th vol. of Med. Chir. Transactions, for the relief of suffocation, caused by the drinking of boiling water.

*Should the tumour be of such a nature, or so situated as not to allow of removal, and at the same time making such encroachment upon the respiratory tube as to render it morally certain that the life of the patient must be soon destroyed, would you, under such circumstances, perforate the trachea?**

245. Under such unpromising circumstances the operation would be fruitless, and therefore unjustifiable.

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* Two very interesting examples of this kind have fallen within my own observation. The first occurred to a corpulent man, sixty-three years of age, and consisted of steatomatous sarcoma. It began very deep beneath the angle of the inferior maxilla. It grew to an enormous size, till it ultimately extended from the base of the cranium to the clavicle, and suffocated the patient.

The second example occurred to a female about fifty years of age. By her own account, the tumour commenced near the parotid gland, and, assuming a flattened shape, gradually extended itself along the cellular membrane over the side of the face and whole of the lateral and anterior part of the neck. The integuments were at no point discoloured, but so firm and hard, as to impart to the finger a feeling as if it pressed on marble. It was not attended with severe pain, but in its progress the lower jaw became fixed, and the patient was eventually choked. After death I made an examination of the tumour. The texture was of a buff colour, intermingled with a pinkish hue, extremely dense, and somewhat corresponded with that species of sarcoma which Mr. Abernethy has denominated mammary or mastoid; but I do not think that it strictly belonged to that species—indeed it appeared to me to be a structure sui generis which I have never seen described.

While speaking on the subject of tumours, I shall mention the following case, to show that some large sarcomatous swellings may sometimes be dispersed contrary to our reasonable expectations.

J. D., ætat. 28, placed himself under my care in the Southampton Dispensary, on account of an enormous tumour upon the epigastric region, which had been gradually increasing during eight months, and which he thought arose in the first place from a strain in lifting a heavy piece of timber. It appeared to be sarcomatous, and extended longitudinally from the ensiform cartilage to the navel, and transversely from the anterior margin of the ribs on one side to that of the other; indeed it could be traced beneath the ribs on the right side. It was of a flattened shape, and as well as I could judge, about three inches in thickness. Its texture was generally firm, except at one point on the left side, where a fluctuation could be distinctly felt, occupying a cavity about the size of a hen's egg. He had been first under the care of a gentleman in the neighbourhood where he lived, and subsequently in the Winchester Hospital, under Doctor Philips; by both of whom many judicious means had been employed, but without success; and I confess, from the opinion I had formed of the character of the tumor, that I did not expect he would have received any benefit from me, fearing lest the disease arose from an enlargement of the liver.

I ordered him the extract of sarsaparilla, with an alterative dose of the oxymuriate of mercury, three times a day, and local friction with the tar-

Should the obstruction, from whatever cause, requiring the operation, be situated at the upper part of the larynx, where would you make the opening into the air-tube?

246. In such a case I should select the small membranous space between the thyroid and cricoid cartilages.

Describe the mode of performing this operation.

247. The patient being seated in a chair (or on the nurse's lap if a child) with his head hanging backward, an incision of sufficient length should be made transversely through the skin, covering this membranous space; after which, the membrane itself may be divided and the air-tube opened. It will at first be necessary to keep the canal open for some little time, till the symptoms of suffocation shall have subsided, after which a canula of proper size and length may be introduced, and retained in its situation by tapes carried round the neck.

Is there danger, in this operation, of wounding any important part?

248. None whatever. In this situation, we are above the thyroid gland and the anastamosis of the thyroid arteries.

Does not a portion of the thyroid gland sometimes occupy this situation?

249. As a very rare exception, a portion of it sometimes extends from its middle to the base of the os hyoides, and in its ascent between the sterno-hyoidei appears like a muscle: but if this should be the case, it must be carefully dissected from its lateral and inferior connexions, and held up, whilst the canal is being laid open.

Should the obstruction be situated in the larynx itself, or should the pressure be caused by a tumour in the neck, at what point of the respiratory tube would you perform the operation?

250. Under these circumstances tracheotomy should be preferred, and performed in the following manner. The patient being seated in the position just mentioned, an incision is to be made, "which is to begin below the cricoid cartilage and to continue downward about two inches along the space between the sterno-thyroidei muscles. Care should be taken not to cut the lobes of the thyroid gland, lest a troublesome and dangerous bleeding be occasioned; and as the left sub-

tarized antimony ointment; but finding that the tumour did not subside under these means, I exchanged the antimonial ointment for that of the hydriodate of potass, by which the tumour was absorbed in about six weeks —when he was discharged from the dispensary cured.

clavian vein lies a little below the upper part of the first bone of the sternum, the incision should never extend so low as this point. The knife must not be carried either to the right or left, in order to avoid all risk of injuring the large blood-vessels situated at the sides of the trachea. The incision in the integuments having been made, the sterno-thyroidei muscles are to be pushed a little towards the sides of the neck, so as to bring the trachea fairly into view. Most authors recommend the point of the knife to be then introduced between the third and fourth cartilages of the trachea, and the opening to be enlarged transversely. It is true that, in this way, an opening may be safely made, large enough to allow a small canula to be introduced. It is safe, however, in all cases, to enlarge the opening in the perpendicular direction, by cutting from within outwards. There is no advantage in avoiding a wound of the cartilages of the trachea, the only reason assigned for cutting the membrane between them in a transverse direction; while a sufficiently large opening cannot be thus safely obtained in cases, in which it is necessary to introduce the muzzle of a pair of bellows, in order to inflate the lungs. In short, it is safer and better, in every instance, to make the wound in the trachea in a perpendicular manner."—*Cooper's Dictionary of Practical Surgery.*

In dividing the trachea perpendicularly, in what direction would you carry the knife?

251. From below upwards—taking care to avoid the thyroid gland.

In performing tracheotomy is there any danger of wounding the principal blood-vessels of the neck?

252. None, when they take their natural course; but when they deviate, it may be otherwise; indeed Desault mentions an instance of the carotid being wounded by this operation. Mr. Burns says that "the arteria innominata is in risk in some subjects I have seen it mounting so high on the forepart of the trachea as to reach the lower border of the thyroid gland. Even the right carotid is not always safe. I am in possession of a cast, taken from a boy of twelve years of age, which shows the right carotid artery, crossing the trachea in an oblique direction. In this subject, that vessel did not reach the lateral part of the trachea, till it had ascended two inches and a quarter above the sternum."

"When both carotid arteries originate from the arteria innominata, there is considerable danger in performing the operation of tracheotomy; for in such cases the left carotid crosses the trachea pretty high in the neck. Professor Scarpa has seen a specimen of this distribution in a male subject, and I have met with five."

"These varieties in the course of the arteries are worthy of being known and remembered; they will teach the operator to be on his guard; since he can never, a priori, ascertain the arrangement of the vessels with any degree of certainty. It will impress on his mind the impropriety of using the knife further than merely to divide the integuments and fascia. If he then clear the trachea with the fingers, he will never injure any of the large arteries. When with the finger he has fairly brought the trachea into view, he ought to examine carefully whether any of the large arteries lie in front of it; and if he find one, he ought to depress it toward the chest, before he penetrates into the wind-pipe."—*Burns on the Surgical Anatomy of the Face and Neck.*

Should hemorrhage occur, during the operation, from any of the branches of the thyroid artery or vein, by what means, and when would you restrain it?

253. Hemorrhage ought to be restrained by ligature, and especially *before the wind-pipe* is opened.—*Cooper's Dictionary of Practical Surgery.*

Should there be no canula at hand, or within reach, what would you substitute for it?

254. "A large silver catheter, or the canula of a trocar, or even a large goose-quill, or, best of all, a piece of sheet lead rolled into a tube and smoothed, will be a substitute for a regular apparatus."—*Charles Bell's Operative Surgery.*

Should these means not be attainable, the same author advises that the bow-end of a double wire should be introduced, and the ends, being bent at right angles at a sufficient distance from the bow, may be carried backwards and fastened around the neck.

But should the introduction of a canula or any other instrument, at either of these points, produce such a degree of irritation, as to render their use inadmissible, what means would you adopt to keep open the incision?

255. It would be right to snip out a portion of the trachea at either point, and thus leave an adequate opening for the purpose of respiration. Mr. Bell advises a crucical incision of the crico-thyroid membrane to be made, and the corners in the centre to be snipped off.—*Surgical Observations.* Mr. Lawrence recommends the removal of a thin slip of the trachea longitudinally.—*Medico-Chirurg. Trans.* Vol. vi.

GENUS 2.—*Dyspnœa a corporibus adventitiis.* Dyspnæa from foreign bodies in the air-tube.

What are the foreign bodies that usually fall into this canal—and to whom does the accident commonly happen?

256. The bodies, which accidentally fall or are drawn into the air-passage, are peas, beans, marbles, buttons, and the like; and the accident most commonly happens to children.

In what part of the canal do such bodies generally lodge?

257. A foreign body may lodge between the glossal ligaments, or in the ventricles of the larynx, or in the trachea.

Are there any diagnostic signs, by which you would decide at which of these situations the extraneous body may be found?

258. Such diagnostic signs are indeed of the highest importance in directing any chirurgical operation for the relief of the sufferer; and notwithstanding any attempt to illustrate the diagnosis must be attended with great uncertainty, I will endeavour to throw some light on this point.

In whatever part of the windpipe a foreign body may lodge, the immediate symptoms will be—frequent cough with frothy expectoration, difficult respiration, and a sense of suffocation: but these symptoms will vary according to the precise situation of the foreign body.

If it have lodged between the ligaments of the glottis, the cough will be incessant; the sense of suffocation most urgent; the voice obliterated, and, in great probability, there will be a disposition to vomit.

If it have lodged in either of the ventricles of the larynx, the cough will be, comparatively, less frequent; the voice more distinct, and the respiration more free.

If it have fallen into the trachea, the voice will be still less affected; the breathing will be laborious, particularly in inspiration, and accompanied with a rattling noise; and should the foreign body have remained in the trachea some time, there will be an emphysematous swelling above the clavicles.*

What is the treatment of this distressing accident?

259. In the first place it will be our duty to examine the

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* Louis was the first to mention this effect. It was found upon dissection to arise from a rupture of the air-cells, and from the escape of the air through the cellular membrane of the lungs and that of the anterior mediastinum. This is probably produced by violent fits of coughing, the foreign body at the same time preventing the escape of the air by the natural channel."—*Mem. de l' Academie Royale de Chirurgie.*

fauces and pharynx accurately, in the hope of being able to extract the foreign body, without making any external opening into the trachea.

Secondly, The patient should be made to masticate and swallow some solid food, to ascertain that the symptoms are not occasioned by the foreign body sticking in the œsophagus.

Thirdly, Should there be the slightest doubt as to the canal in which it may be situated, a probang should be passed into the stomach, to assure us that the lodgment has not taken place in the œsophagus. Having found that no obstruction exists in that canal, we are called upon immediately to relieve the trachea.

What are the next steps to be taken?

260. An emetic should be first administered, with a view to dislodge and expel the foreign body.

What reason have you to suppose that an emetic possesses this power?

261. As the act of vomiting frequently discharges layers of coagulated lymph from the windpipe in the cynanche trachealis, so it may discharge a foreign body from that canal.

Should full vomiting not succeed in this object, what would be your next treatment?

262. The operation of bronchotomy ought to be performed without delay.*

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* Mr. Earle, in his observations on an instance of this kind, which is recorded in the Med.-Chir. Transactions, vol. 12, page 27, and which was successfully operated upon by Doctor William J. Hart, of Dartmouth, says, "that the operation of tracheotomy is the only effectual and rational mode of relieving persons with foreign substances in the windpipe, is a truth which cannot be too often inculcated: and it is not less true and important, that the operation should be performed as promptly as possible, before symptoms of irritation and inflammation have established themselves, which it may not be in our power to arrest, even by the removal of the exciting cause. If any additional arguments were required in support of the immediate adoption of the operation, as soon as it has been ascertained that any foreign body has passed into the windpipe, I would urge the consideration, that the patient's life is in the most imminent and constant danger, from the possibility of the substance being again forced, by any violent effort of coughing, into the rima glottidis, where it may cause almost instant death, before any assistance can be afforded; of which occurrence numerous instances are recorded, and many more have no doubt taken place."

The objection which parents make to the performance of this operation on their children is, unfortuately, sometimes insuperable. A child was brought to me, almost in a state of suffocation from a tamarind-stone having fallen into the trachea. As there was no time to be lost, I proposed the operation of tracheotomy—the only possible means of saving the child's life. This was strongly objected to by the mother, in spite of my most earnest intreaties, and the child fell a victim to her obstinacy in a short time afterwards.

*But would it not be safer to leave the patient to the chance of dislodging the foreign body, in the course of time, by the act of coughing, or to dispose of it by the powers of the constitution, than to inflict upon him the operation, seeing that persons have recovered, under similar circumstances, without it?**

263. Certainly not. For although in the case here related, (and probably there may be some others) the foreign body was ultimately expelled by the natural efforts, and the patient recovered; still such cases must be viewed only in the light of the merest exceptions; for ample experience assures us, that foreign bodies in the air-tube almost always produce either suffocation at the time of or shortly after the accident, or become the cause of a fatal pulmonary disease.

Should the body, from its size or situation, not produce very urgent symptoms, would you consider the operation immediately necessary?

264. As the principal object of the operation is to remove the danger of suffocation, so, if such symptoms were not present, this measure would not be called for.

At what part of the windpipe would you perform it, if necessary?

265. This must depend upon which of the above-mentioned parts of the canal, the foreign body shall have lodged. If there be reason to suppose, from the symptoms stated at 258, that it has lodged in the larynx, the crico-thyroid membrane,

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* Case. A young gentlemen, during the act of eating a plum, unguardedly swallowed the stone, which fell into the larynx, and caused the usual symptoms attending such an accident. A surgeon was sent for; who, supposing that the stone had lodged in the œsophagus, passed a probang down that canal; and as the symptoms appeared to be somewhat relieved, concluded that he had succeeded in pushing the stone into the stomach. From this time, however, the patient became affected with a troublesome cough, and gradually declined under all the usual symptoms of phthisis-pulmonalis. Indeed, so unequivocal were the characters of that disease, that several eminent physicians were of the opinion, that the symptoms were the result of common morbid causes, and not of irritation from any foreign body. Various medicines were prescribed which appeared best calculated to relieve him, but without any beneficial effect; and as he had become extremely emaciated, the case was pronounced to be confirmed phthisis pulmonalis, and the prognosis of course unfavorable. Things went on in this unpromising manner till about eight or nine months after the accident; when, by an effort of coughing and retching, a large hard lump was expectorated, which, on inspection, proved to be the plum-stone, enveloped in a kind of capsule of coagulated lymph. From that moment he rapidly recovered, and has since enjoyed many years of good health.

In this instance it should seem that the stone was lodged in one of the laryngeal ventricles.

and even the thyroid cartilage itself, may be carefully divided; but should the symptoms direct us to the trachea, the operation should be performed there in the manner recommended at 250.

Should you find it necessary to cut through the thyroid cartilage, at what part and in what direction ought it to be divided?

266. Having penetrated the crico-thyroid membrane, the incision should be carried upwards through the middle of the anterior angle of the thyroid cartilage, and upon a director, previously introduced.

What frequently happens, as soon as a sufficient opening into the windpipe has been made?

267. That the foreign body is coughed up through the opening.

But should this not take place, in what manner would you proceed?

268. I should immediately search for the foreign body, and remove it by a pair of dressing forceps, or some instrument best calculated for the purpose.

Having extracted it, what would be your treatment of the wound?

269. Strips of adhesive plaister should be laid transversely across the wound, with the view to heal by the first intention.

ORDER III.—*Ostructio œsophagea.* Œsophageal obstruction.

GENUS 1.—*Deglutitio difficilis a corporibus extraniis.* Difficult deglutition from extraneous bodies.

What are the foreign bodies that commonly obstruct, or lodge in, the pharynx or œsophagus?

270. Portions of food—such as parts of muscle not sufficiently masticated, of tendons, bones, coins, pins, &c.

Should you be called to a person, suffering from a pin or fish-bone sticking into this canal, how would you attempt to remove it?

271. Much would depend on its situation. If it should have pierced a tonsil gland, or be visible in any part of the fauces or upper part of the pharynx, I should remove it with a pair of dressing forceps; if it should be situated lower down in the pharynx, beyond the possibility of seeing it, I should

cautiously introduce the fore and middle fingers, in the hope of detecting and extracting it;* but should it have passed into the œsophagus, beyond the reach of the fingers, I should leave it to fall into the stomach.

Is there not an instrument invented for the purpose of raising pins, coins, and such kind of bodies, lying across the canal?

272. Yes—there is an instrument invented for this purpose, consisting of a double wire, bent at its bow-end to an acute angle of about half an inch in length and breadth, and answering to Graefe's extractor (a French instrument).

Ought this instrument to be preferred to the fingers?

273. Certainly not. The fingers of the surgeon should always precede the use of such an instrument, especially for the extraction of pins, fish-bones, and small coins; and when we are under the necessity of using it, the greatest possible care should be taken, lest the foreign body drop into the larynx, as it is raised from the throat. Nevertheless, such an instrument may prove highly useful in extracting a coin that may lie transversely across the gullet.†

Should a piece of muscle, tendon, or the like, lodge in the œsophagus, what treatment would you adopt?

274. It should be immediately pushed into the stomach by a probang, the sponge of which is to be previously moistened with warm water and oiled.

Should the foreign body be hard and angular, or have jagged edges, such as a piece of bone—how would you dispose of it?

275. I would endeavour to raise it in the best manner I

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* This is by far the best mode of extracting pins that have lodged in the lower part of the pharynx. I have succeeded in doing this several times, to the great delight of the patients, who are always greatly alarmed by this accident. To prove the superiority of the fingers for the extraction of pins lying across the pharynx, I will relate the following case. A gentleman being sent for to visit a lady who had swallowed a pin, endeavoured to raise it with an instrument, invented for the purpose; but not having succeeded, and having allayed (as he supposed) all apprehension on the part of his patient as to any ill consequences of the accident, he returned home. Very soon after he had left the house, another surgeon was called in, who introduced his fingers into the pharynx and extracted the pin without the slightest difficulty, and with deserved credit to himself.

† M. Dupuytren lately succeeded in extracting a five-franc piece from the pharynx of a young man, by Graefe's extractor, after emetics, and a curved pair of forceps had been tried in vain.—*Lancette Françoise.*

could, either by a pair of long curved forceps, or by Weiss's forceps for extracting small calculi from the urethra, or by nooses of wire, or bunches of thread with a multitude of nooses fastened upon the sponge end of a probang—*(Cooper's Dict. of Practical Surgery)*;—but if these means should fail to extract it, I should feel inclined to leave the case awhile to the powers of the constitution, provided the symptoms were not urgent, and the patient could swallow fluids. I say, that I would choose this alternative rather than run the risk of lacerating the mucous membrane, or perhaps splitting the sides of the canal by the forcible use of the probang.* Yet if it should not drop into the stomach, and if the patient should be endangered by the lodgment, *I should at all hazards*, push it down.

Should it be impracticable to push it into the stomach, and there were symptoms of suffocation, what measures would you adopt?

276. I should feel justified, provided the lodgment were in a situation to admit of it, to perform the operation of œsophagotomy without delay.

By what circumstance would you ascertain that the lodgment was within the reach of this operation?

277. By a projection of the throat.

But should there be no projection of this kind to direct the operator, where to make an external opening, ought the operation to be performed?

278. Certainly not.

On the contrary, should such a projection be manifest, and the operation indispensable, how would you perform it?

279. "The patient is to sit with his head inclined backward, and steadily supported by an assistant. The skin having been pinched up in a transverse fold, an incision is to be made in the integuments from the upper part of the sternum. The cellular substance, between the sterno hyoideus and sterno thyroideus and trachea, is next to be divided. With two blunt hooks the lips of the wound are to be kept open; and on separating the cellular substance at the side of the trachea with the aid of the finger and a few strokes of the knife, the œsophagus will be seen. The lower part of this tube is then to be opened, and the wound in it enlarged with a pair of curved

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* Case. A lady having accidentally swallowed a portion of bone, aed finding that it would not pass into the stomach, sent for her medical attendant, who immediately pushed it down with a probang. The consequence was fatal to her.

blunt-pointed scissars, a director being employed, if any difficulty arise. With a small pair of curved forceps, similar to those used for the extraction of polypi, the foreign body may then be removed."—*Cooper's Dict. of Practical Surgery.*

On which side of the neck ought the operation to be performed?

280. The œsophagus inclines to the left side of the neck; but the situation for the operation must be decided by the projection of the foreign body.

Is not this a most difficult operation, endangering many parts of the highest importance to the patient, and even life itself?

281. Assuredly—and it ought never to be performed but upon the most necessitous occasions—occasions that can occur but very rarely to any one individual surgeon.

What parts are particularly endangered by the operation?

282. The large blood-vessels and nerves of the neck; but more particularly the recurrent branch of the eighth pair of nerves, the superior and inferior thyroid arteries and veins, and the thyroid gland.

What part would you keep in view as the best guide for your incisions?

283. The trachea—to which I should keep close, in order to avoid the trunk of the carotid artery.

But would you not in such a course endanger the recurrent branch of the pars vaga?

284. This nerve, being situated at the side and posterior part of the trachea, would certainly be in my way; but by sponging the wound frequently, I should be enabled to discover it, and cause it to be held aside out of danger of the knife.

State the relative situations of the principal blood-vessels, the trachea, and the recurrent nerve to the incision.

285. The trachea and recurrent nerve will be on the inner edge of the wound, the carotid artery and jugular vein on the outer edge; the superior thyroid vessels above, and the inferior ones below.

Should any of the thyroid vessels be unavoidably wounded, and bleed profusely, by what means would you stop the hemorrhage?

286. By the usual method of ligature; and this should be done immediately, in order that the operation may not be impeded.

Having performed the operation and extracted the foreign body, what would be your after treatment?

287. "After the operation, an elastic gum-catheter should be passed from one of the nostrils down the pharynx and œsophagus, by which means the requisite food and medicines may be injected into the stomach, without any risk of their passing through the incision and retarding the cure."—*Dict. of Prac. Surgery.* The external opening should be treated as an incised wound.

ORDER IV.—*Vulnera propria jugularia.* Wounds proper to the neck.

GENUS 1.—*Vulnus tracheale.* Wound of the trachea.

What are the wounds of the neck most usually met with?

288. Wounds of the trachea, œsophagus, nerves and blood-vessels: and these are usually inflicted by maniacs or others in the attempt at suicide.

How would you treat a transverse division of the trachea?

289. If the division be incomplete, the opening should be closed, and the tube kept in its natural position by bringing the head forward and supporting it with pillows, so that the chin may lie upon the breast. "It is proper, however, to assist the effects of a suitable position with strips of sticking-plaister, and sometimes with a stitch or two."—*Cooper's Dict. of Practical Surgery.*

Should this canal be completely divided, by what means would you keep the severed ends in their proper situation?

290. By sutures—taking care not to pass them through the mucous membrane. In this case the trachea should be well supported by adhesive plaisters, extensively applied, first longitudinally and then transversely; and the contact of the divided parts of the windpipe further assisted, by the chin being kept upon the breast in the manner just mentioned.

By what means ought a patient, under such circumstances, to be fed?

291. By the aid of an elastic gum-tube, passed through one of the nostrils down the œsophagus—which contrivance will enable him to take food and medicine without disturbing the wound.

Is not hemorrhage a frequent occurrence in this kind of wound?

292. Certainly. Indeed wounds of this nature can hardly happen without producing a dangerous, if not fatal hemorrhage.

What are the vessels usually wounded in this case?

293. The carotid arteries, or some of their branches and their accompanying veins.

Should several branches of the external carotid artery be divided and bleed profusely, would you pass a ligature around each, or take up the common trunk?

294. The mouth of each bleeding vessel should be tied, if practicable; if not, we should tie the nearest trunk from which they are derived; but should it be unsafe to dilate the wound for that purpose, the common trunk ought to be secured.

Where is this artery to be found, and what important parts are endangered by the operation?

295. The trunk of the common carotid artery will be found beneath the inner margin of the sterno-cleido mastoideus muscle. The parts that are endangered by the operation are—the internal jugular vein and the eighth nerve of the brain.

What is the relative situation of the trunk of the carotid to the par vagum and the internal jugular vein?

296. The nerve lies externally to the artery, and the vein externally to both; and the whole is enclosed in a sheath of condensed cellular membrane.

How would you take up the artery without detriment to the accompanying vein and nerve?

297. "In order to get at the carotid artery in the safest manner, Mr. Abernethy has recommended making an incision on that side of it which is nearest the trachea, where no important parts are exposed to injury, and then to pass the finger underneath the vessel. The par vagum must be carefully excluded from the ligature; for to tie it would be fatal."

The following is Sir Astley Cooper's mode of tying the common carotid, as recorded in the 1st. vol. of the Medico-Chirurgical Trans. "I made an incision, two inches long, on the inner edge of the sterno-mastoid from the inferior part of the tumour (an aneurism) to the clavicle, which laid bare the omo and sterno-hyoideus muscles, which being drawn aside towards the trachea, exposed the jugular vein. The motion of this vein produced the only difficulty in the operation; as, under the different states of breathing, it sometimes presented itself to the knife tense and distended, and then as suddenly collapsed. Passing my finger into the wound to confine that vein, I made an incision upon the carotid artery, and, having laid it bare, I separated it from the par vagum, and introduced a curved aneurismal needle under it, taking care to exclude the recurrent nerve on the one hand and the par vagum on the other."

Suppose you were called to a case, in which the trunk of the common carotid has been wounded, how would you stop the flow of blood?

298. A surgeon seldom has an opportunity of exercising his art in this case, as the wound, in almost all cases, proves fatal upon the spot; but if he were fortunately at hand, pressure should be instantly made upon the vessel; after which the external wound may, if necessary, be enlarged, and the artery tied both below and above the orifice.

Explain your reason for placing a ligature above and below the division of the artery.

299. To prevent hemorrhage by anastomosis.

But should there be a necessity for enlarging the wound, would there not be danger of wounding a muscle running transversely across the neck?

300. "We shall find a small muscle, the omo-hyoideus, passing obliquely over the artery, about an inch and a half from the head of the clavicle," which must be detached and held out of the way.—*Bell's Operative Surgery.*

What are the relative situations of the descendens noni and sympathetic nerves to the artery?

301. The descendens noni, which is a branch of the ninth pair, descends obliquely over, and the sympathetic nerve under, the carotid artery, lying close upon the vertebræ.—*Bell's Anatomy.*

Describe the operation of cutting down upon the external carotid artery with the view of tying it.

302. "Cut through the skin from the lobe of the ear towards the point of the os hyoides; dissect through the platysma myoides; we then come to the digastric muscle; we dissect a little along its upper edge, and there we find the stylo hyoideus; forcing this last muscle a little downwards, we find the continued trunk of the external carotid artery."—*Bell's Operative Surgery.*

Where would you find the lingual artery, with a view to secure it?

303. The following are Mr. C. Bell's instructions on this point. "The lingual artery makes its great curve (being tortuous) immediately above the great horn of the os hyoides; it then passes under the stylo-hyoideus. Were it ever necessary to cut upon it here, let the extreme point of the os hyoides be the mark; for it turns just above it to pass under the stylo-hyoideus. Cut through the platysma myoides; raise the lower edge of the submaxillary gland. Take care of the

nerve, which you see lying near it: it is the ninth pair, and is betwixt the artery and the tendon of the digastrical or biventer maxillæ."*

From what trunk is the inferior thyroid artery derived?

304. From the subclavian artery.

Can the trunk of the inferior thyroid artery be tied in the living body?

305. "The inferior thyroid lies in a situation not to be tied." —*Ibid.*

But in the event of a wound of this artery, would you not tie the subclavian?

306. As the inferior thyroid artery is derived from the subclavian before it passes behind the anterior scalenus muscle, the tying it at this point, not only from its depth, but more particuarly from its being connected with several important vessels and nerves, would be destitute of almost every hope of success. Mr. Cooper says, "When I consider the manner in which the subclavian artery, before it passes behind the anterior scalenus, is surrounded by parts of great importance, I can scarcely bring my mind to think that the measures, requisite for taking up the vessel in this situation, will ever leave the patient much chance of recovery."—*Dictionary of Practical Surgery.*

GENUS 2.—*Vulnus æsophageum.* Wound of the œsophagus.

What would be your treatment of a wound of the æsophagus?

307. This is a case which seldom falls under chirurgical treatment, as the effect of so deep a wound most generally destroys the patient at once; but should this canal be wounded without producing such fatal results, the wound should be treated externally upon common principles, and internally by the introduction of a gum-elastic tube of a capacity sufficient for the passage of food and medicine. The patient should be rigorously kept in a state of quietude.

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* It is quite impossible to lay down any precise rules for finding the branches of the principal arteries, as they vary so much in their relative course. This knowledge can be acquired only in the dissecting room; let me, therefore, again earnestly advise the student never to relinquish his studies, till he has accurately and repeatedly dissected those arteries, that may at some future time suddenly challenge his scalpel.

CLASS VI.—*Thoracica.* Thoracic emergencies.

ORDER I.—*Fracturæ.* Fractures.

GENUS 1.—*Fractura costarum.* Fracture of the ribs.

How could you discover a simple fracture of the ribs?

308. When one or more of the ribs have been fractured, the patient complains of acute pain of the part injured, which is accompanied from time to time with a peculiar catch of the respiration; but the case may be placed beyond all doubt either by an inequality having taken place on the outer surface of the rib, or by placing one hand on the point injured, and the other on the opposite side of the chest, and desiring the patient to cough, by which means a grating or crepitus will be readily perceived, if the rib be fractured.

What symptoms would enable you to decide on the lungs being injured by a simple fracture of the ribs?

309. Cough—accompanied by expectoration of blood, and emphysema.

What is the treatment of a simple fracture of the ribs?

310. A large soap plaister having been applied over the fracture, the patient should be made to expel as much air as possible by a forcible expiration; then a broad flannel roller is to be carried firmly around the chest, so as to compel the respiration to be performed wholly by the descent and elevation of the diaphragm. The bandage may be kept in its position by a scapulary. The patient should be purged, and kept in a state of quietude.

What treatment would be required, if a simple fracture were accompanied with a wound of the lungs?

311. Over the external injury a linen compress, wet with the liquor plumbi subacetatis dilutus, should be substituted for the soap plaister, as tending more to prevent and control inflammatory action; for the same reason, a calico roller should always be used instead of flannel, which may be made wet at the part covering the compress, with the same lotion; but to prevent cold, and to appease the apprehensions of the patient, it may be applied in a tepid state. The local treatment being thus disposed of, a liberal quantity of blood should be

taken away from the system; a saline purgative administered, and the antiphlogistic treatment most rigidly insisted on.

GENUS 2.—*Fractura sterni.* Fracture of the sternum.

What is the treatment of a simple fracture of the sternum without displacement?

312. The same as that recommended for a simple fracture of the ribs.—Vide 310.

What are the symptoms indicative of thoracic injury or compression?

313. Dyspnœa, cough, blood-spitting, palpitation or irregular action of the heart, emphysema and an inability to lie on the back.—*Cooper's Dictionary of Practical Surgery.*

How would you treat a compound fracture of this bone accompanied with depression?

314. Much will depend on the effects of the depression upon the thoracic viscera. Should the heart or lungs be uninjured, and their action uninterrupted, the wound ought to be dressed upon general principles, and the fracture steadied by a bandage. In this case the bone should not be elevated, unless it could be easily done by a lever; but, should the depression be such as to have injured or impeded the action of the thoracic viscera, the bone ought to be elevated; and, if necessary, by the aid of the saw.

Would the integuments not being wounded, influence this treatment?

315. Assuredly not. Should there be no external wound, an incision of the integuments must be immediately made, in order to admit of the means that may be deemed necessary for the elevation or removal of any portion of bone requiring to be elevated or removed.

Are any other measures necessary in the primary treatment of this case?

316. The bone being elevated, the wound dressed, and a bandage applied around the chest, the patient should be largely bled; a purgative administered; and quietude, and the antiphlogistic regimen strictly enjoined.

ORDER II.—*Dislocatio.* Dislocation.

GENUS 1.—*Dislocatio costarum.* Dislocation of the ribs.

At what points may a rib be dislocated?

317. A dislocation may occur at the articulation of the rib with the spine, which is certainly a very rare occurrence; or it may happen at its junction with the cartilage by which it is affixed to the sternum.—*Sir Astley Cooper's Treatise on Dislocations and Fractures of the Joints.*

How would you discover a dislocation of the first kind?

318. By an indentation in the tract of the rib or ribs dislocated, by painful and difficult respiration, and in short by the usual symptoms of fracture of these bones.

What appearances present themselves in the dislocation of the last kind?

319. When the rib is torn from its sternal cartilage, there will always be a projection at this point in addition to the usual symptoms of fracture.

What treatment would you adopt in dislocations of the ribs?

320. In the first kind it will be impracticable to restore the head of the bone to its natural position; and, therefore, we must be content to steady the thorax by a circular bandage; but, in the second, "the patient is to be directed to make a deep inspiration, and then, the projecting cartilage is to be pressed into its natural situation; a long piece of wetted pasteboard should be placed in the course of three of the ribs and their cartilages, the injured rib being in the centre; this dries upon the chest, takes the exact form of the parts, prevents motion, and affords the same support as a splint upon a fractured limb. A flannel roller is to be applied over this splint, and a system of depletion pursued to prevent inflammation of the thoracic viscera."—*Ibid.*

ORDER III.—*Vulnera propria thoracica.* Wounds proper to the thorax.

GENUS 1.—*Vulnus pulmonum.* Wound of the lungs.

By what symptoms would you discover a wound of the lungs?

321. Doctor Hennen, in his excellent work on The Principles of Military Surgery, says, that "bloody expectoration *immediately* on receiving the wound, and the terrible symptoms

of dyspnœa, sense of stricture and suffocation, insupportable anxiety and faintness, which succeed, soon enough discover the fact: and if by good fortune no intimation is given in this way, happy is the surgeon, and thrice fortunate the patient." —*Military Surgery.*

Suppose that no such intimation were given by these formidable symptoms, but that you had reason, nevertheless, to fear that the contents of the thorax were injured by the wound —would you take pains to ascertain this fact by manual investigation?

322. Certainly not. Such a discovery would be of no practical benefit; whilst the poking of the wound, and the consequent admission of the external air, would tend to increase the inflammatory symptoms about to follow,

What artery in the walls of the thorax is liable to be wounded in such a case?

323. The intercostal artery, which runs along the groove at the inferior edge of each rib.

From what trunks do these arteries arise?

324. The first two or three are derived from the intercostalis superior, which is a branch of the subclavian artery. The remaining nine or ten spring from the aorta.

Is hemorrhage from these arteries a frequent result of penetrating wounds of the thorax?

325. This artery, from its situation, is very liable to be wounded in penetrating wounds of the chest, and, according to Doctor Hennen, bleeds more profusely than might be expected.

By what method would you restrain hemorrhage from the intercostal artery?

326. If the vessel can be got at, it may be secured by ligature; if not, especially if the bleeding be consequent upon extensive sloughing, a compress should be placed upon the vessel, and judicious and constant pressure made upon it by the finger of an assistant, who may be relieved as often as may be necessary.—*Military Surgery.*

What is the treatment of an incised wound that has penetrated the thorax, but which has not inflicted any manifest injury of the lungs?

327. The wound should be immediately closed by adhesive plaister, and the chest kept steady by a circular bandage.

Should a wound of the chest be caused by a gun-shot, which either lodges between the ribs, or fractures them, and falls into the thoracic cavity,—how would you treat the case?

328. Should the ball have lodged in the parietes of the thorax, we ought to remove it by one blade of the forceps, used as a lever. If it should have fractured the ribs and dropped into the cavity of the chest, after having removed the spicula of bone, occasioned by the fracture, a pair of curved forceps should be introduced in search of the foreign body. A successful case of this kind is recorded in the Medical and Surgical Journal, vol. iii. page 353.

If the external opening should not be large enough to admit of the use of the forceps, or the extraction of the ball,—what measures would you adopt?

329. Doctor Hennen says that, "the ball generally fractures the rib so extensively, as to admit of its being removed by the orifice through which it entered, which may, if necessary, be enlarged," and which was done in the case just cited. "Baron Larrey recommends removing a portion of the upper edge of a rib with a lenticular, so as to avoid the intercostal artery, and thus to make room for the extraction of the foreign body; this operation he has performed with success."—*Mémoires, de Chirurgie Militaire*, vol. iv. p. 259.

You have stated the principal symptoms that denote a wound of the lungs, is there any other that you have omitted in that statement?

330. Yes; there is another symptom, though not immediately occurring upon the infliction of the injury; I mean emphysema; but Doctor Hennen observes, that it is not so frequent a result as has been supposed.—*Military Surgery.*

Suppose, in the language of the same author, "There lies a man with a wound of his chest; the blood is oozing from the external orifice in a constant, though slow, florid track; in his frequent and painful efforts to cough, it is thrown up in frothy arterial mouthfuls, mixed with occasional clots; his breathing is oppressed almost to suffocation; his pulse is quick, weak, and fluttering; his eyes are starting from their sockets; his nostrils are distended in his efforts at relief by inspiration; and his extremities are cold, and often tossed about in fruitless anguish,"—how would you treat such a deplorable case?

331. He replies, "The mode which should instantly be adopted in such a case is as follows: without searching after balls or fragments, or attempting to ascertain the precise tract of the bayonet or the pike, or expatiating, (as I have seen done by some young gentlemen fresh from their studies) upon the particular vessels or their branches, which may be injured, let the man lie quietly along, and lose from thirty to forty ounces

of blood from his arm by a large orifice. This done, we should remove the cloths or handkerchiefs, which may have been hurriedly put over the wound to staunch the blood. If he has fainted during the bleeding, or if we find him in that state when we arrive, instead of administering any cordials to him, we should put our fingers into the wound, and extract every thing within reach, whether cloth, ball, iron, wood, splinters of bone, or clots of blood. If the orifice is not sufficiently large, we must not be afraid of making it moderately larger by a cautious use of the probe-pointed bistoury, or the sharp one, with a small morsel of wax on the end of it; by this means, we make way for the removal of extraneous bodies, and may possibly discover the bleeding orifice of one of the intercostal arteries, which sometimes are cut, but not at all so often as speculative writers would lead us to believe. We now proceed to dress the wound itself. If it is gun-shot, a light, mild, dressing will be sufficient; but if incised, the wound should be closed at once; and this treatment will be found to afford the most certain preventive to emphysema, future hemorrhage, and collections of matter. I scarcely recollect an instance, where it was necessary to remove the adhesive straps, or (where it was gun-shot) the usual dressings. We now lay the man down, and let him remain as quiet as possible, and in as cool and airy a spot of the barn, church, or hospital, as we can find."—*Principles of Military Surgery.*

Should the patient be attacked, after some hours, with "a fresh spitting of bloody froth, and a repetition of all the symptoms of approaching suffocation,"—what treatment would you adopt?

332. "The lancet must again be had recourse to; and if by this management, repeated as often as circumstances demand, the patient survives the first twelve hours, hopes may begin to be entertained of his recovering the immediate effects of the hemorrhage."—*Ibid.*

Have you any medicines to recommend in this stage of the injury?

333. In the after-treatment of a wound of the nature here described, we shall be considerably assisted by the aid of medicine; but until the danger of immediate death from hemorrhage is over, we must not think of employing any thing except depletion by the lancet; *it*, and *it alone*, can save the life of the wounded man."—*Ibid.*

If there be reason to suppose the foreign body has lodged *in the substance of the lungs, would you attempt to search for it, with a view to extract it?*

334. Either of these attempts would be fruitless in persons, whose lungs were not adhering to the side at the point wounded; but should the pleural sac have been previously obliterated, and the lungs adherent, the most gentle search may be made, and we may attempt to extract the ball, if found to be within practical reach; but if not, it is infinitely better to leave the foreign body to the disposal of the constitution, than add to the injury by rude and fruitless attempts to extract it.*

What treatment would you adopt in protrusion of the lungs from the external wound that will not admit of reduction?

335. These protrusions, "in the hands of the older surgeons, were removed by the knife, a practice now rejected, and gentle pressure substituted."—*Military Surgery.*

If external emphysema should have commenced before you are called to a patient suffering with a wound of this kind, how would you treat it?

336. By "incisions and punctures cautiously employed;" by closing the wound, and by the circular bandage.—*Ibid.*

How would you treat an accumulation of air within the sac of the pleura?

337. "By closing the wound at once, and without ceremony, by a bit of adhesive plaister and the preventing bandage."—*Ibid.* The same author observes that any small portion of air that may remain within, is soon decomposed or absorbed.

Do you then mean to assert that, in all cases of recent wounds of the thorax, the external orifice should be closed by proper dressings and bandage?

338. Certainly; and without hesitation; and in this reply I am supported by Doctor Hennen, Baron Larrey, Mr. Cooper, and others.

Are severe wounds of the chest generally fatal?

339. Doctor Hennen makes the following observation: "I should be unwilling to lull either a patient or a surgeon into a false security, or to underrate the real dangers of any case; but I have seen so many wounds of the thorax, both from pike and sabre thrust, and from gun-shot, do well ulti-

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* "Balls have been found in the substance of the lungs, after a residence of twenty years there, the patient preserving a perfect state of health, and no peculiarity of symptoms denoting their site."—*Percy's Manual.*

mately, that I cannot but hold out great hopes, where the third day has been safely got over; for though occasional hæmoptysis may come on at almost any period during a cure, and its approach can neither be prevented nor anticipated; the more deadly hemorrhages are usually within the first forty-eight hours; and yet to this alarming symptom, when within moderate bounds, the safety of the patient was often due."

He farther states that he has "met with many cases, where, no surgeon being within reach, the spontaneous and unchecked hemorrhage has saved the patient's life; no attempt at surgical treatment, except a very clumsy one of applying rags or handkerchiefs to the wound by the patient or his brother officers, having ever been made; the bleeding has ceased spontaneously, the wound has closed, and any extravasation of either blood or air within the thorax, has been absorbed."

GENUS 2.—*Vulnus arteriæ axillaris.* Wound of the axillary artery.

Describe the mode of taking up the axillary artery immediately below the clavicle.

140. I should make "a semi-lunar incision through the integuments, which is to have its convexity downwards, and to begin about an inch from the sternal end of the clavicle, being continued towards the acromion for the extent of three or four inches, so as to end near the anterior margin of the deltoid muscle, without reaching into the space between the deltoid and pectoral muscle, in order to avoid wounding the cephalic vein. This incision will expose the fibres of the pectoral muscle, which are now to be divided in the direction and extent of the external wound. The flap is then to be raised by dividing the loose cellular membrane which connects the pectoral muscle with the parts underneath it. The pectoralis minor will now be seen crossing the inferior part of the wound; and, introducing his finger between the upper edge of this muscle and the clavicle, the surgeon may feel the pulsation of the axillary artery. Here, one of the cervical nerves lies above, but in contact with the artery; the other nerves are behind it. In the dead subject, the axillary vein is situated below it; but in the living, the vein is distended, and conceals the artery. The cellular membrane connecting these parts is to be separated by careful dissection, or by lacerating it with a blunt instrument. A ligature having been drawn under the artery

with an aneurism needle, the ends of the cord are to be raised, and a finger passed down so as to compress the part surrounded by the ligature.—*Hodgson on Diseases of Arteries.*

But should the wound of the vessel be so near the clavicle, as to oblige you to tie the subclavian artery at the point where it emerges from behind the anterior sauleuus muscle—how would you perform the operation?

341. The following are Mr. Hodgson's observations and directions on this subject: "When the subclavian artery has emerged from behind the anterior scalenus muscle, it passes obliquely over the flat surface of the first rib, with which it is in immediate contact. The cervical nerves are situated above and a little behind the artery: the subclavian vein passes before it and underneath the clavicle. If the finger be passed down the acromial margin of the anterior scalenus muscle, the artery will be found in the angle, formed by the origin of that muscle from the first rib. The shoulder being drawn down as much as possible, the skin is to be divided immediately above the clavicle, from the external margin of the clavicular portion of the mastoid muscle, to the margin of the clavicular insertion of the trapezius; no advantage whatever is gained by cutting the clavicular attachment of the ster. cleido-mastoideus. The exposed fibres of the platysma-myoides are now to be carefully divided, without wounding the external jugular vein, which lies immediately under them, near the middle of the incision, and should be detached and drawn towards the shoulder with a blunt hook. The cellular membrane, in the middle of the incision, is then to be cut, or separated with the finger, until the surgeon arrives at the acromion edge of the anterior sculenus. He passes his finger down the margin of this muscle, until he reaches the part where it arises from the first rib, and in the angle formed by the origin of the muscle from the rib, he will feel the artery. The ligature is now to be conveyed under the vessel with an aneurism-needle, or that recommended by Dessault."

Class VII.—*Abdominalia.* Abdominal emergencies.

Order I.—*Gastrica.* Gastric.

Genus 1.—*Injuria a veneno.* Injury by poison.

What is the best classification of those poisons, that act directly upon or through the medium of the stomach?

342. Orfila divides them into four kinds, viz.—
Irritating,
Narcotic,
Acrid, and Narcotic, and
Septic poisons.
Orfila's Toxicology.

SPECIES 1.—*Injuria a venenis irritantibus.* Injury by irritating poisons.

What poisons are included in the first species?

343. Those that produce inflammation of the stomach, such as the concentrated acids and alkalies, certain mercurial and arsenical preparations, &c.

State the poisons of this kind that are most commonly met with in practice.

344. The concentrated acids, the white oxide of arsenic, and the oxymuriate of mercury (corrosive sublimate).

If a person should have designedly swallowed any of the concentrated acids, how would you ascertain the fact?

345. By searching for the vehicle that contained the poison, by applying a proper test between the lips, by the discoloured appearance of the mouth and internal fauces, and by the symptoms.

What are the most convenient tests for the discovery of an acid?

346. Litmus paper and the red cabbage, which detect acids by being turned of a bright red colour.

What are the symptoms that are consequent upon swallowing a concentrated mineral acid?

347. "Sensation of burning in the throat, the æsophagus, and the stomach; styptic taste in the mouth; great thirst; the eyes red and sparkling; the pulse very frequent and tense; and the skin hot and dry; the tongue red and glazed; the lips black; vomiting of blood and yellow matter having the pungent odour of the acid; cold sweats, delirium, and death."—*Thomson's Conspectus. See also Black's Translation of Orfila.*

Should you have discovered that the symptoms are caused by the sulphuric, the muriatic, or the nitric acid—what treatment would you adopt?

348. If it be possible to administer chalk or magnesia,*

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* In the Medical Gazette of the 24th January, 1829, will be found an interesting case, in which two ounces of the concentrated sulphuric acid

these are the antidotes which ought to be preferred. But if it will consume time to get them, then, a solution of soap, an article more likely to be at hand, should be administered; and, while it is in preparation, the acid should be diluted by the free use of any mild fluid, milk or oleaginous matters being preferred. The carbonates of the alkalies are by no means eligible antidotes, being themselves possessed of corrosive properties. After the proper antidote has been given to a sufficient extent, the use of diluents ought to be continued, as this renders the vomiting more easy."—*Christison on Poisons.*

What are the symptoms produced by a poisonous dose of the oxalic acid?

349. "Violent and most acute pain, excessive vomiting of a dark-coloured and sanguinolent fluid, catharsis, a pulse imperceptible at the wrist, and a sunken countenance, indicating the nearness of death, seem to be the symptoms observed."—*Beck's Medical Jurisprudence.*

Dr. A. T. Thomson* gives the symptoms as follow: "Burning pain of the stomach; nausea, and severe but ineffectual efforts to vomit; great dilatation of the pupils; vertigo; convulsions and death."—*Conspectus.*

What is the treatment of a person who has swallowed a poisonous dose of the oxalic acid? *

350. We ought to "administer as soon as possible after the poison has been taken, a mixture of chalk and water, and then evacuate the oxalate of lime thus formed, by exciting vomiting by copious dilutions, and irritating the fauces."—*Thomson's Conspectus.*

Would you endeavour to evacuate the stomach before you gave an antidote to this poison?

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were swallowed, and which terminated favourably, under the judicious treatment of Mr. Orr, assistant surgeon to the 95th regiment. Magnesia was first given as an antidote, and the subsequent inflammation combatted with bleeding and blisters.

* Should there be any reason to fear that the oxalic crystals had been sent instead of Epsom salts, the patient should use the following precautionary tests, which will shew the real character of the medicine:—

1. Taste the suspected substance. If it be oxalic acid, it is very sour; if epsom salts, very bitter and saline.

2. Litmus, and blue sugar-loaf paper are reddened by the acid, but not affected by the salts.

3. Take a little writing ink, and drop it on one or two of the suspected crystals. If they be Epsom salts, no alteration will occur; but if oxalic acid be present, the ink will become of a reddish brown.—*Beck's Medical Jurisprudence.*

351. "Time should never be lost in administering them, if an antidote is at hand."—*Christison on Poison.* But should no antidote be at hand, the stomach-pump ought to be employed, or "emetics may be given, if vomiting is not already free."—*Ibid.*

Is there any other antidote that could be beneficially administered?

352. "Magnesia has also been of service in the only instance in which it has hitherto been employed."—*Edin. Med. and Surgical Journal.*

Explain the action of these two antiaotes.

353. "These substances" (chalk and magnesia) "not only neutralize the acid, so as to take away its corrosive power, but likewise render it insoluble, so as to prevent it from entering the blood."—*Christison.*

If no chalk or magnesia were at hand, would you employ the alkalies?

354. No; alkalies, which were once used as antidotes, are inadmissible, because, as they form only soluble salts, will not deprive oxalic acid of its remote or indirect action."—*Ibid.*

Dr. Christison and Dr. Coindet, "found that the oxalites of potass and ammonia are very little inferior in energy to the acid itself;" "they do not corrode; nay, they hardly irritate: but they produce tetanus and coma, like the dilute acid."—*Ibid.*

Should the patient be unable to swallow from a constriction of the throat, how would you convey the proper remedies into the stomach?

355. By means of the stomach-pump; the long tube of which may be introduced through the mouth down the œsophagus, by which means we could not only inject, bnt evacuate the stomach.

What are the symptoms consequent upon swallowing a poisonous dose of the white oxide of arsenic?

356. "The patient complains in general of a constriction of the throat, pain in the back part of the mouth, in the stomach and intestines; of a desire to vomit, followed by vomiting with more or less violence. The matter vomited is of various colours, often mixed with blood."——"To these alarming symptoms are joined frequent and fœtid eructations, hiccup, difficulty of respiration, approaching to suffocation; the pulse becomes small, hard, and accelerated; and, in certain cases, it may be said to vibrate under the finger like a piece of catgut. We seldom find it unequal and intermittent, that is,

having not the same interval between each pulsation. An inextinguishable thirst, difficulty of making water, cramps, the extremities of an icy coldness, horrible convulsions, general decay of strength, the features of the face changed, delirium; such are the symptoms which announce approaching death, unless energetic measures for relief be speedily put in practice."—*Black's Translation of Orfila.*

What is the treatment of a case of poisoning by arsenic? *

357. We ought to "evacuate the stomach by administering large draughts of tepid mucilaginous fluids, or sugar and water, or chalk and water, or lime-water."—*Thomson's Conspectus.*

"If vomiting should be delayed, as often happens, for half an hour or more, advantage ought to be taken of this opportunity to administer an emetic of the sulphate of zinc, with the view of withdrawing the powder in mass before it is diffused over the stomach; and for the same purpose, milk should be drank liberally both before and after vomiting has begun, as it appears to be the best substance for enveloping the powder, and so procuring its discharge. The patient should never be allowed to exhaust his strength in retching, without some milk or other fluid in his stomach to act on. The stomach-pump, although it has been applied to cases of poisoning with arsenic, does not seem to possess any advantage whatever over the natural efforts of nature, if succeeded by copious draughts of liquids. Even emetics are unnecessary, when vomiting has commenced in consequence of the operation of the poison."—*Christison on Poisons.* "Tartrite of antimony should never be given."—*Beck's Medical Jurisprudence.*

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* The following are the most convenient tests of arsenic, given by Dr. A. T. Thomson:—"If any solid particles be found in the stomach, mix one part of them, with three of a mixture, consisting of one part of finely powdered charcoal, and two parts of dry carbonate of potass. Put this into a small glass tube, the upper inner surface, or empty part of which, clean with a feather, and stop the open end loosely with a little tow, or a piece of soft paper; then place the closed end among red-hot coals for a few minutes, or in the flame of a spirit-lamp; when, if arsenic be present, a brilliant metallic crust will be found lining the upper part of the tube; and which, when placed on hot coals, will exhale dense fumes and a strong smell of garlic.

If no solid particles be found, strain the washings of the stomach through a piece of linen rag; and, dividing the fluid into different portions, test each portion separately by the following re-agents:—

1. Touch the surface of the fluid with a stick of lunar-caustic; a beautiful yellow precipitate, as seen by reflected light, will proceed from the point of contact, if arsenic be present.

2. Drop some of the suspected fluid on a piece of white paper, so as to make a broad line; then draw several times along this line a stick of lunar-caustic, and brush the streak lightly over with liquid ammonia. If arsenic be present, a bright queen's yellow is produced, which remains permanent for nearly an hour.

3. Dissolve in two drachms of the suspected fluid, three grains of the sub-carbonate of ammonia, and add a warm solution of five grains of sulphate of copper. If arsenic be present, a lively grass green precipitate will be produced.

4. Into the fluid stir a moderate quantity of charcoal in fine powder; allow it to settle; then filter, and to the powder, when dry, add a little carbonate of potass, and sprinkle some of this mixture on a red-hot poker: if arsenic be present, the smell of garlic will be perceptible. No single test should be relied on; and it should also be understood, that the vehicle in which the poison has been exhibited, often alters the results of re-agents."—*Conspectus.*

In cases of death by irritant poisons, we must take into our consideration the symptoms, the appearances on dissection, and the results of the tests, which we may think fit to employ, and draw our conclusion from the concurrence of all these.

Are there any antidotes to this poison which ought to take precedence of the above treatment?

358. None. It is true, that the sulphuret of potass, magnesia, and charcoal, have been recommended as such, but we are not to lose time by administering them; for the first, by forming an arsenical sulphuret, would be as dangerous as the oxide of arsenic itself; and the two last, being inert substances, totally destitute of chemical action on arsenic, could not materially impair the operation of the poison on the economy.—*Christison on Poisons.*

Having removed the poison, what indications remain to be fulfilled, and in what manner would you fulfil them?

359. The indications will be to prevent or subdue inflammation, and "to support the system under that extraordinary depression, which it undergoes in the generality of cases;" and this will best be done by diluents of the farinaceous kind, by bleeding as far as the symptoms will allow, by blisters, and by anodynes. "Opium, in repeated doses, will without doubt, prove useful, when the poison has been removed and the inflammation subdued by blood-letting."*—*Christison on Poisons.*

What are the symptoms produced by a poisonous dose of the oxymuriate of mercury (corrosive sublimate)?

360. "An acrid, styptic, metallic taste, with the sensation

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* In a case of most severe idiopathic gastritis, after bleeding had been duly employed, I found large doses of the tincture of opium of the utmost service in subduing that burning pain, which is so distressing in this disease.

of fulness and burning in the throat; copious salivation, but not always; great anxiety; tearing pains of the stomach and intestines; nausea; frequent vomiting of a fluid occasionally mixed with blood; diarrhœa; tenesmus; the pulse small, quick, and hard; frequent faintings; universal debility; difficult respiration; cold sweats; cramp of all the members; convulsions, and death."—*Thomson's Conspectus.*

*What treatment would you adopt in a case, where a poisonous dose of the corrosive sublimate has been swallowed?**

361. I would "give large quantities of the white of egg diluted in water, in repeated doses. The albumen decomposes the corrosive muriate, and reduces it to the state of calomel, which, acting on the bowels, carries itself off by purging."—*Ibid.*

Suppose that no eggs could be immediately procured, what remedies would you substitute in the meantime?

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* The following are the best tests for detecting the presence of the oxymuriate of mercury:—

1. "If the poison be found in the solid state, its nature may be suspected by its sensible qualities; but to ascertain the truth, mix the suspected substance with an equal weight of very dry sub-carbonate of potass; then put the mixture into a small glass tube, and heat it gradually to redness; if it be corrosive sublimate, mercury will be obtained in metallic globules."

2. "If the suspected poison be a fluid, and a colourless liquid, place in it a small piece of clean polished copper, and allow it to remain for a short time, when it will be covered with a white coating, that will acquire a metallic lustre when rubbed, if corrosive sublimate be the poison; or pour it into lime-water, which will produce an orange-yellow precipitate, if this salt be present."

3. "We may also employ the following test of Mr. Silvester:—bend a piece of iron wire, three inches long, into the shape of the Greek letter, Π, and tie the two ends to the sides of a plain gold ring. On a plate of glass, not less than three inches square, laid horizontally, drop some diluted sulphuric acid, till it spread the size of a shilling. At a little distance, next drop some of the suspected solution, until the edges of the two liquids touch one another. Then lay the wire and the ring, united as above described, in such a manner that the wire may touch the acid, and the gold ring be in contact with the suspected fluid. If corrosive sublimate be present, the ring, in a few minutes, will be covered with mercury at the part which touches the fluid."

4. "If the solvent be wine, coffee, or any coloured liquid, agitate it slowly for ten minutes in a phial, with two or three drachms of sulphuric æther; then, after the fluids have separated by rest, pour off the æther, and evaporate it in a small porcelain capsule. If corrosive sublimate be present, it will remain in a solid form in the capsule; and that it is that salt, may be proved by dissolving the residue in water, and precipitating, as already described, with lime-water."—*Ibid.*

For more extensive information on these subjects, consult the works of Beck, Orfila, Christison, &c.

362. "In defect of eggs, milk, gum-water, decoction of linseed, of mallows, sugar and water, or simple water, should be taken in abundance." "By this means the energy of the sublimate will be weakened, and the stomach filled with liquids. The mere fulness of the stomach will produce vomiting, and consequently the evacuation of the poison."—*Orfila.*

If vomiting be not speedily excited, the stomach-pump should be used.

What treatment would you adopt for the inflammatory effects of this corrosive poison?

363. Such effects should be combated by general and local bleeding, by tepid baths, narcotic medicines, bland purgatives, and a diluent and demulcent diet.

Might not the blistering fly be reckoned as belonging to the class of irritating poisons?

364. Yes; this drug, in the hands of wicked and designing persons, is a poison of great power.

By what symptoms would you discover that it had been administered?

365. The usual symptoms are, "Nausea, vomiting, and purging; the matter ejected, in either case, being frequently bloody and purulent; acute epigastralgia; writhing colic; great heat and irritation of the bladder and urinary organs, accompanied with the most painful priapisms; the pulse is quick and hard; and although thirst is often great, yet there is occasionally a terror of liquids. If these symptoms be not soon relieved, they are followed by convulsions, tetanus, delirium, syncope, and death. Throughout the attack, the breath of the patient has a very peculiar, faint, sickly odour." —*Thomson's Conspectus.*

What is the treatment of this case of poisoning?

366. When "discovered early enough, and vomiting has not already begun, emetics may be given; and if vomiting has begun, it is to be encouraged. Oleaginous and demulcent injections into the bladder generally relieve the strangury. The warm-bath is a useful auxiliary. Leeches and blood-letting may be required, according as the degrees and stage of the inflammation may seem to indicate."—*Christison on Poisons.*

* Nothing has been said here of poisoning by alkalies, as this case is not very commonly met with; but I have lately seen three instances—in two of which about ʒiij of the subcarbonate of potass were swallowed by mistake. The patients complained, on swallowing the draught, of burning sensations of the œsophagus and stomach; after which, the pain was referred to the bowels, which, in one case, continued painful for several weeks.

Species 2.—*Injuria a venenis somniferis.* Injury by narcotic poisons.

What are the principal poisons of this species?

367. Opium; henbane and hemlock; prussic acid; tobacco; and stramonium.

What are the symptoms caused by a poisonous dose of laudanum?

368. "Drowsiness and stupor, which are followed by delirium, pallid countenance, sighing, deep and stertorous breathing, cold sweats, convulsions, apoplexy, and death.*"—*Thomson's Conspectus.*

What treatment is required in this case?

369. The contents of the stomach should be instantly evacuated by the stomach-pump, if at hand; if not, "an emetic consisting of ʒss. of the sulphate of zinc, or from gr. v. to gr. x. of sulphate of copper, dissolved in an ounce of water, should be exhibited as soon as possible," repeating the dose if necessary; "and the vomiting may be kept up by irritating the fauces.† After the stomach is emptied, give large draughts of

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In the third, a lady had taken, by mistake, ℥ij of an embrocation, which principally consisted of the strong liquid ammonia. I found her in a state of great alarm, with her mouth open, scarcely able to speak, and complaining of violent burning pain of the œsophagus and stomach. She had fortunately been sick, and had thrown up a part of the embrocation. These efforts of nature were again excited by copious and frequent accidulated drinks, and by such meaes she was speedily relieved.

* There is a peculiar appearance of the countenance of persons under the influence of an over dose of laudanum or opium, which, being once witnessed, cannot afterwards be easily mistaken; but when a poisonous quantity has been swallowed, and the early symptoms are not observed, those, which follow from the full action of the poison, are not so readily recognised. The patient will now be found totally insensible—the pupils will be permanently contracted—the voluntary muscular power will be lost—and the *respiration carried on at intervals*, continuing with loud moaning expirations for about thirty seconds, and then altogether ceasing for about the same space of time. The pulse will be regular, but vary as to strength; the countenance will be pale and bloated, and a watery sweat will be poured from the whole surface of the body. These symptoms were taken from a fatal case, which fell under my observation in the winter of last year. The patient had very probably taken an ounce of solid opium.

† A mustard emetic will be sometimes found very effectual under such circumstances. It may easily be made by mixing two or three teaspoonfuls of the powdered mustard, with a wine-glass of warm water. It ought to be administered at short intervals, till vomiting is produced. After ineffectual

vinegar and water, and other acidulous fluids, with coffee, brandy, and cordials; keeping awake and constantly rousing the attention of the sufferer, until the effects of the poison subside. Immersion in the tepid bath is a useful means of subduing the drowsiness." *—*Ibid.*

Beside the above treatment, Dr. Christison recommends, in the event of the failure of emetics, and of there being no stomach-pump at hand, the injection of an emetic into the veins. He says, "Tartrate of antimony answers best for this purpose, and its effect is almost certain; a grain is the dose. While injecting it, care must be taken by the operator not to introduce air into the veins."—*Christison on Poisons.*

It is also recommended to dash cold water frequently over the head of the patient, with a view to rouse the torpid state of the system.—*London Medical Repository*, No. xviii. p. 26. —*London Medical and Physical Journal*, No. xlviii. p. 225.

Dr. Christison further observes that "it is always useful to stimulate the nostrils from time to time, by holding strong ammonia under the nose;" that bleeding may be necessary when the pulse is full and strong; and that "in desperate circumstances, artificial respiration may be used with propriety." Of the use of the last means of recovery, he gives two examples.

What are the symptoms that characterize poisoning by henbane?

370. "Sickness, stupor, dimness of sight, and delirium, followed by coma, and great dilatation of the pupils; the pulse is at first hard, but becomes gradually weaker and tremulous; petechiæ often make their appearance as the forerunners of death."—*Thomson's Conspectus.*

Is there any chemical test, that would lead you to suspect this poison had been swallowed?

371. None whatever.

Describe the manner of treating this case.

attempts to evacuate the stomach by other emetics, I have seen the mustard act so forcibly, as to cause the stomach to eject its contents to a considerable distance.

In the 1st vol. of the *Med. Chir. Trans.* page 77, Dr. Morell gives an interesting case of poisoning with laudanum, in which the patient had swallowed ℥vj. and which was successfully treated by an emetic of fifteen grains of the sulphate of copper, dissolved in water.

* Might not a strong infusion of green tea, after the due evacuation of the stomach, be a powerful means of rousing the patient from the drowsiness resulting from large doses of opium?—*See a pamphlet written on the Medicinal Properties of Green Tea, by Mr. Newnham, of Farnham.*

372. "If the poison have been recently taken, evacuate the stomach by a powerful emetic, and afterwards administer vinegar and acidulous drinks; but if the poison have already entered the system, bleed and purge freely, to reduce the inflammatory symptoms, exhibiting at the same time acidulous liquids."—*Thomson's Conspectus.*

State the symptoms of a person poisoned by hemlock.

373. "Sickness and difficulty of respiration, great anxiety, vertigo; delirium, which often rises to phrenzy; dilatation of the pupils, stupor, convulsions, and death."—*Ibid.*

What treatment ought to be employed to counteract the effects of this poison?

374. The same as that recommended for the effects of henbane.—(372.)

What are the symptoms consequent upon the taking a poisonous dose of the prussic acid?

375. "When the dose is large, death is the immediate result; but if the dose does not exceed from 10 to 20 minims, it is succeeded by stupor and weight in the head, nausea, faintness, and vertigo, with loss of sight, followed by difficulty of respiration, dilated pupils, a small vibrating pulse, and syncope, which terminate insensibly in death, if no curative means be employed."*—*Thomson's Conspectus.*

How would you treat the case of a person being poisoned by the prussic acid?

376. We ought to "administer, as quickly as possible, hot brandy and water, or camphor mixture, combined with liquid ammonia, or the aromatic spirit of ammonia. Oil of turpentine also, and the whole range of diffusible stimuli, will prove useful."†—*Ibid.*

Orfila, in addition to the remedies just mentioned, recommends emetics, afterwards the infusion of coffee, and lastly, every half hour, three or four table-spoonfuls of the oil of turpentine mixed with coffee.*

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* Dr. Hennen (editor of the "Medical Topography of the Mediterranean"), has gradually increased the dose of this medicine, to allay the pain from the pressure of an aneurism of the aorta, till the patient could take with impunity one fluid drachm!

† Dr. Christison, after examining the merits of ammonia, chlorine, and cold affusion as remedies for this poison, comes to the following conclusion:—"On the whole it appears that the proper treatment of a case of poisoning with hydrocyanic acid, consists in the use of the cold affusion, and the inhalation of diluted ammonia or chlorine;" (chlorine 1, water 3) "and as chlorine will hardly ever be at hand, ammonia will commonly be employed. Venesection is also probably indicated by the signs of congestion of the head."

What are the deleterious symptoms of tobacco, taken into the stomach?

377. "Severe nausea, vomiting, headache, and other sensations of inebriety; sudden sinking of the strength, cold sweats, convulsions and death."—*Thomson's Conspectus.*

What measures would you take for the recovery of the patient?

378. If the surgeon be called early, the stomach-pump should be used, or he may "evacuate the stomach by two or three grains of emetic tartar, the action of which may be assisted by irritating the fauces. If, however, some time has elapsed, we must administer castor oil and purgatives, and immediately after, lemon-juice, or vinegar and water; but if the sedative effects be already produced, nothing can be done until the habit is roused by brandy, camphor, and cordials.—*Thomson's Conspectus.*

What deleterious symptoms result from a poisonous dose of stramonium, and what treatment do they require?

379. "Vertigo, delirium, sometimes furious madness, stupor, convulsions, paralysis, cold sweats, and death" are the symptoms resulting from this poison, and the treatment will be the same as has been recommended for the poisonous effects of laudanum.—(See 369.)

Dr. Christison says, "Blood-letting seems peculiarly called for in poisoning with the thorn-apple, on account of the strong signs of determination of blood to the head."

SPECIES 3.—*Injuria a venenis acro-somniferis.* Injury by acro-narcotic poisons.

What cases of poisoning by this species are most commonly met with in practice?

380. The belladonna, digitalis, fungi, nux vomica, and the colchicum autumnale.

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* "The hydrocyanic acid exists in several plants, which are consequently poisonous." The plants which have been thoroughly examined and found to yield it, belong to the division pomaceæ of Jussieu's Natural Family, the Rosaceæ. These are the bitter-almond, cherry-laurel, bird-cherry, and peach. The poison procured from them exists in two forms—as a distilled water and as an essential oil."—*Ibid.*

It also exists, though in a weaker degree, in other plants of the same natural order.

Describe the symptoms resulting from a poisonous dose of the belladonna.

381. "A sense of great dryness and stricture of the pharynx and œsophagus, sickness, vertigo, dilated pupils, and dimness of sight; laughter, delirium, redness and tumefaction of the face; convulsions. The stomach and bowels become sometimes so paralyzed, that vomiting can scarcely be produced by the most powerful emetics, and death ensues."—*Thomson's Conspectus.*

Are there any means of ascertaining that the belladonna has been swallowed so as to cause these symptoms?

382. "There is no chemical test for ascertaining the presence of this poison in food; but the botanical characters both of the leaves and the fruit should be familiar to every practitioner. The berries, which are most likely to be eaten by children, are large and roundish, with a longitudinal furrow on each side of a very deep purple colour, smooth, shining, and seated within a green cup or calyx. Their taste is sweet and agreeable."—*Ibid.*

What is the treatment of a case of poisoning from belladonna?

383. "Give emetics of sulphate of zinc or of copper; then evacuate the bowels by active purgatives and glysters, and follow these by large doses of vinegar and water, or other vegetable acids."—*Ibid.* The previous use of vinegar has been recommended, and it is said the emetics act with more certainty after its use.—*Paris' Pharmacologia,* 3d edition, p. 150.

What are the symptoms resulting from a poisonous dose of the digitalis?

384. "Intermitting pulse, vertigo, indistinct vision, nausea, hiccup, cold sweats, delirium, syncope, convulsions, and death." —*Thomson's Conspectus.*

What treatment do these symptoms require?

385. "Cordials; for example, brandy, aromatic confection, and opium; and a blister may be applied to the epigastrium."—*Ibid.*

What are the symptoms occasioned by eating poisonous fungi?

386. "Different fungi produce different effects on the animal system; but the more general symptoms are pains of the stomach, nausea, vomiting, and purging; colic, cramp of the lower extremties; convulsions, both general and partial; an unquenchable thirst, vertigo, delirium, and death. These

symptoms do not occur immediately on swallowing the poison, and sometimes not till ten or twelve hours afterwards."—*Ibid.*

State the treatment of such a case.

387. We ought "first to evacuate the poisonous substances by emetics and purgatives, or by combinations of these; for example, three or four grains of emetic tartar, or twenty-four grains of ipecacuanha powder, in solution with two ounces of the sulphate of soda. Castor-oil is a valuable purgative in these cases. The lancet is sometimes necessary. After the stomach and bowels have been emptied, give small but repeated doses of æther in mucilage, and dilute with vinegar and other acidulated liquids."—*Ibid.*

What are the deleterious effects of the nux vomica?

388. "Sensations of inebriety; vertigo; tetanic rigidity of the limbs and arms, alternating with subsultus tendinum; extreme difficulty of respiration, asphyxia, and death."—*Ibid.*

What treatment would you adopt to counteract these effects?

389. We should "evacuate the stomach and bowels, and then dilute freely with vinegar and water, and other acidulous drinks."—*Ibid.*

What are the symptoms of a poisonous dose of vinum colchici?

390. "Nausea and vomiting, violent griping, and hypercatharsis, sinking of the pulse, and cold sweats."—*Ibid.*

What treatment would you adopt to remove these symptoms?

391. The stomach should be evacuated by "bland demulcent fluids, taken in large doses; and then we should exhibit opium in small doses with cordials."*—*Ibid.*

SPECIES 4.—*Injuria a venenis septicis.* Injury by septic poisons.

What are the septic animal poisons, which, by being eaten, produce deleterious effects, and therefore demand our attention in this place?

392. Certain fish, either from their being in a morbid state when eaten, or from some specific quality, act as septic poisons.

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* The Colchicum wine has frequently proved fatal to gouty persons, by being kept in too large a quantity, and swallowed in the moment of pain and impatience in mistake for other draughts. Half a dozen doses would be amply sufficient for any patient to have in his possession at once.

Of these are mussels, the dolphin, the conger, the king-fish, the yellow-bill, &c.*

State the symptoms which are consequent upon eating poisonous mussels.

393. Acute pain of the head and stomach, with great difficulty of breathing, general uneasiness, redness, and swelling of the face and eye-lids, intolerable itching of every part of the body, an eruption of little wheals,† similar to what are produced by the stinging of nettles, and this is particularly observable upon the shoulders; convulsions, and sometimes sudden stoppage in the head, in such a manner that one would be inclined to say the patient was suffering under a violent cold." —*Orfila.*

What is the best treatment of a case of this kind?

394. "Evacuate the stomach by a powerful emetic, and by irritating the fauces with the finger or a feather, until full vomiting be excited; purge with castor oil, and at the same time dilute freely with acidulous liquids, giving at short intervals from 20 to 40 drops of æther in half an ounce of simple syrup."—*Thomson's Conspectus. See also Orfila.*

SPECIES 5.—*Injuria a liquoribus ardentibus.* Injury by spirituous liquors.

Under what circumstances do spirituous liquors act as a poison?

395. When drank in very large quantities, undiluted, and in a short space of time.

What are the symptoms of such a degree of intoxication?

396. Stupor, insensibility, stertorous breathing, dilatation of the pupils; in short, an almost total abolition of sense and motion.

By what marks would you distinguish this case from that of apoplexy?

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* The yellow bill (clupea thrissa) inhabits the shores of America and the Indies. It appears to be extremely poisonous, and even fatal, in a very short space of time.

† Mr. Black, the translator of Orfila, in a note, page 127, says, that this eruption "constitutes the disease termed by Dr. Willan, urticaria febrilis, or febrile nettle-rash." On this point I am disposed to differ from him. The urticaria febrilis is a rare disease, extremely distinct in its appearance and symptoms, and *runs its course in about seven days.* I have met with two cases of it, which accurately corresponded with the representation and description given in Dr. Willan's work.

397. By the previous history of the case, the habits of the patient, the smell of spirituous liquors, or of the liquid that has been drank, and by there being left probably some degree of muscular power.

What measures would you adopt to relieve the symptoms of extreme intoxication?

398. In the first instance, a liberal quantity of blood should be taken from the external jugular vein or the arm.*

Secondly. The stomach should be evacuated by the stomach-pump, or emetics of tartarised antimony, ipecacuanha, sulphate of zinc or copper, aided by copious dilutions.

Thirdly. A brisk purge should be given, followed by frequent acidulated drinks; and, should an alarming degree of stupor remain, the bleeding ought to be repeated, cold lotions applied to the naked scalp, a blister applied to the neck, sinapisms to the feet, and purgative glysters thrown up the rectum. In such a desperate case, of course, the internal means must be administered to the stomach through a tube introduced down the œsophagus.†

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* When a congestion of blood has taken place in the cerebral veins it will certainly be right and preferable to open the external jugular; but when the circulation is free and unimpeded through the axillary and subclavian veins, the cava, right side of the heart, and lungs, this outlet has not so much advantage over that of the brachial vein, as might at first be imagined. For example. Suppose twelve ounces of blood were taken from the median cephalic, so much less would flow into the subclavian, and consequently from this source so much less into the cava, thus causing a vacancy in the cava to be supplied by the jugular. Should there be any obstruction to the return of blood in the above-mentioned channels, the advantage of bleeding the external jugular vein will at once be manifest; and, lest such should exist, it will be always best to take blood from this source in these cases.

† Let me advise the young practitioner, who may be called to an extreme case of this kind, not to be satisfied with the discovery that his patient is merely in a state of intoxication, and therefore do nothing for his relief, but to act decidedly, suiting his measures to the exigencies of the case. Should he leave his patient to take the chance only of being restored to himself, as the baneful effects of the spirit, which he has drank, shall subside, he may regret the passive course he has taken. I recollect an instance that was thus negatively treated. The patient in reasonable time regained his senses certainly, but not without the permanent loss of the muscular power of one side from an attack of hemiplegia.

Before I take my leave of the subject of poisons, I would say a few words to those whose business it is to dispense medicines. Instances, unfortunately, are not wanting, where persons have fallen victims to a mistake either in the vending of drugs or in the making up of prescriptions; and such lamentable occurrences may be often traced to the custom of placing bottles and drawers, containing decided poisons, in the same row, or on the same

ORDER II.—*Intestinalia.* Intestinal.

GENUS 1.—*Hernia strangulata.* Strangulated hernia.

At what parts of the abdomen does a hernia usually take place?

399. At those parts where the parietes make the least resistance; viz. at the umbilicus, the abdominal ring, and beneath Poupart's ligament.

Does it occur at any other part?

400. A hernia may and does occur at various other parts of the abdomen.

What are the parts that are most commonly protruded into a hernial sac?

401. A portion of the omentum, or of the intestines, or both.

Is not a hernia named according to its contents?

402. Yes. When a portion of intestine only is protruded, the rupture is called "enterocele;" if only omentum, "epiplocele; and when both the omentum and intestine are protruded, "entero-epioplocele."

But might not a hernia contain portions of other viscera besides those just enumerated?

403. A portion of the stomach may possibly be found contained in a hernial sac;* and a portion of the bladder has, not unfrequently, been protruded.

You have stated that a hernia is named according to the contents protruded, is it not also named according to its situation?

404. Yes; a hernial protrusion at the navel is called an "exomphalos," or "umbilical rupture;" at the abdominal ring,

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shelf, with medicines in more common use. It is true they are labeled visibly and aright, but in the hurry of business, or in the moment of inattention, one drawer may be opened for another, and one bottle taken down for another, and the mischief done. The oxalic acid may be mistaken for a salt, or the arsenical solution for some other liquid of the same colour. I am not speaking impossibilities. How often has the oxalic acid proved fatal in this way!—I well remember the mother of a family falling a sacrifice to the solution of arsenic being added to a draught instead of the red poppy syrup. The prevention of these distressing accidents may be easily effected by keeping all poisonous preparations in a locked cupboard, or on a shelf too high to be reached without the aid of steps.

* I have twice seen a small hernial protrusion situated upon the epigastric region; but as these were never strangulated so as to require operation, I cannot take upon myself to say that a portion of the stomach was included in either of them.

"an inguinal rupture or bubonocele;" through the same opening into the scrotum, "an oscheocele, or scrotal rupture *" beneath Poupart's ligament, "a femoral or crural rupture or merocele;" and if occurring at any other part of the abdomen, "a ventral hernia."

Is there not another kind of rupture, to which a specific name is given?

405. There is also a congenital hernia, so called from its having existed from birth.

How many kinds of congenital hernia are there?

406. The congenital umbilical and the congenital inguinal hernia.

What are the incipient symptoms of strangulated intestinal rupture?

407. "In an incarcerated intestinal rupture, the tumour, which was before indolent, becomes painful; the pain is most acute at the strictured portion, and extends from that situation over the rest of the swelling and abdomen; these parts becoming at the same time swollen and tense. A feeling of tightness, as if from a chord drawn across the upper part of the belly, is often one of the earliest symptoms of strangulation. The pain, which at first is not constant, becomes in the sequel fixed, and is augmented by external pressure, coughing, sneezing, or other agitations of the body. The evacuations per anum are entirely suppressed, and nausea and vomiting ensue; all the contents of the stomach, and afterwards those of the intestine down to the stricture, being rejected."—*Lawrence on Ruptures.*

Does the presence of these symptoms place the life of the patient in imminent danger?

408. Such symptoms, indicating incarceration, obstruction, and inflammation of a part of the alimentary canal, undoubtedly place his life in imminent danger; and, therefore, not a moment of time should be lost in our endeavours to avert it.

What are the symptoms of an omental hernia?

409. The symptoms of omental hernia are "milder and slower in their progress. In this variety of the complaint, stools may generally be procured by purgative medicines or glysters. The connexion of the omentum with the stomach induces hiccough and sickness; and although the latter symp-

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* A hernial protrusion into the labium pudendi of the female may be called "a labial rupture."

tom seldom proceeds to stercoraceous vomiting, it exists in a most distressing degree, and particularly characterizes the complaint. The symptoms are often influenced by the position of the body, being mitigated by bending, and aggravated by straightening, the trunk. An epiplocele is occasionally accompanied with all the dangerous and alarming symptoms of an intestinal rupture, as insuperable constipation, fecal vomiting," &c.—*Ibid.*

Are there any local circumstances that would assist you in deciding betwixt an enterocele and an epiplocele?

410. If the hernia be an epiplocele, or one of the omental kind, the tumour has a more flabby and a more unequal feel; it is in general perfectly indolent, is more compressible, and (if in the scrotum) is more oblong, and less round than the swelling occasioned in the same situation by an intestinal hernia; and if the quantity be large, and the patient adult, it is in some measure distinguishable by its greater weight."—*Pott.*

Is there any disease, which, co-existing with a rupture, may be mistaken for strangulation?

411. "The intestine, included in a large hernia, may be affected with cholic, and thus give rise to constipation and vomiting."—*Lawrence on Ruptures.*

"The most important case, however, is where a patient with a rupture has an attack of ileus from some other cause, in which the original complaint is not at all concerned."—*Ibid.*

What circumstances will enable you to arrive at an accurate conclusion?

412. "The following circumstances will enable the practitioner to decide in similar cases, that the symptoms are not produced by the hernia; that it is not strangulated; and that the ileus arises from an internal cause. The pain is felt in the abdomen, and not in the swelling, which continues soft; whilst the belly is inflated, hard, and tense. The attack is sudden, and not preceded by any of the occasional causes which could affect the rupture; and the ring is free. The affection extends in the sequel to the swelling, which then becomes painful and tense; but it appears later here than in the belly, and does not proceed to so great a degree."—*Ibid.*

Having then satisfied yourself that the case before you is strangulated hernia, what is the first step to be taken?

413. "I should immediately proceed to reduce it by what is called 'the taxis.' The patient is placed in a recumbent position, with his head and shoulders a little elevated, and his

thighs at right angles with his body. His bladder should be previously emptied. The surgeon, standing on the right side of the patient, passes his right hand down between the thighs to grasp the swelling, and with his left thumb and fingers he kneads the hernia (supposing it to be inguinal) at the upper part of the inguinal canal. Slight pressure and elevation of the scrotum, with a kneading of the upper part of the hernia, are used for the purpose of returning a small portion of the protruded parts, when the whole usually follows without difficulty. The pressure should be continued a quarter of an hour at least, for I have known it to succeed after a trial of twenty minutes."—*Sir Astley Cooper's Lectures by Tyrrell.*

What degree of pressure ought to be used in the taxis?

414. The object is to use a continued steady pressure, and not violent means; which, in several instances which have come under my observation, have caused a rupture of the intestine."—*Ibid.*

Suppose the tenderness of the part to be so great as to forbid the immediate employment of the taxis, what other means would you employ?

415. Under such circumstances Sir A. Cooper has employed the application of ice with complete success.—*Ibid.*

In what direction would you make your pressure during the employment of the taxis?

416. The pressure should be exerted according to the direction in which the protrusion has taken place; that is, directly backwards, or perpendicularly to the surface of the abdomen, in umbilical or ventral ruptures; upwards and outwards in the common external inguinal hernia; first backwards, then downwards and inwards in femoral hernia."

" However, when we fail in one direction, we must try others; and we may sometimes be assisted by a knowledge of the attitude and circumstances, which the patient himself finds most conducive to reduction."—*Lawrence on Hernia.*

Are you acquainted with any other method of reduction beside that just mentioned?

417. " If the efforts at reduction, managed according to the above directions, are not attended with success, the following method has been recommended. A strong man, placed in a convenient position near the edge of the bed, supports the lower extremities on his shoulders, so that the patient's head and chest only rest on the bed. Attempts at reduction in this posture are said to have succeeded after every thing else had failed,

and have therefore been highly recommended by some surgeons."*

If you should fail to reduce the rupture by the taxis alone, what other means would you adopt to facilitate the reduction?

418. Bleeding, the warm bath, purgative medicines by the mouth and in the form of glyster, injections of tobacco, opiates and other antispasmodics, the cold bath, and various cold and warm applications to the part."—*Lawrence.*

What is your opinion of the efficacy of bleeding in this case?

419. Bleeding will be found an important measure on two accounts.

" First, by the faintness which it produces, it frequently becomes the means of assisting the return of the hernia."

Secondly, " If the hernia be not reduced, it saves the patient from the danger of peritoneal inflammation, which an operation is likely to produce. I never saw it do harm, and have in many cases witnessed its extreme efficacy. In the strong and athletic, it should be carried to a very great extent; in the old and infirm, little need be taken away. From neglect of bleeding, the patient very often dies four or five days after the operation, from peritoneal inflammation. The object is to produce a fainting state, otherwise the bleeding does very little good."—*Sir Astley Cooper's Lectures by Tyrrell.*

Should bleeding fail of relaxing the stricture, what is the next step you would take?

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* Mr. Lawrence does not think that this position promises any advantage, nor do I, in the generality of cases; yet there may be instances in which it may be successfully employed. The following case will illustrate this remark:—J. S., ætat. 56, long afflicted with an inguinal rupture, which he had kept up by a spring truss, was suddenly seized with constant vomiting, a suppression of the alvine discharge, and all the common symptoms of strangulated hernia. Suspecting at once that the symptoms arose from a strangulation of his rupture, I examined the groin, but could not discover the slightest protrusion. As purgatives and various other means were tried to remove the obstruction of the bowels in vain, I could not divest my mind of the suspicion, that a small knuckle of intestine or omentum was incarcerated within the canal by the tendon of the internal oblique, or transversalis muscle. I, therefore, had decided on cutting down upon the abdominal ring; but before I resorted to this measure, I caused him to be suspended on a person's shoulders in the manner above directed, making pressure at the same time with my fingers upon the abdominal ring. The result was, (whatever may have been the cause of the symptoms), that the obstruction was speedily removed, and that the purgatives, which before had completely failed, now acted most copiously.

420. "The next object, which the surgeon has in view, when bleeding and the taxis fail, is to put the patient in the warm bath, which is of no use, unless it occasions faintness. I have had several opportunities of witnessing its efficacy in assisting reduction. If there is not immediate convenience for its use, no time should be lost in procuring it, as there are other and more powerful remedies."—*Ibid.*

To what remedies do you allude?

421. The local application of cold and the tobacco injection.

In what manner ought these remedies to be used?

422. "Cold will best be applied by putting ice, broken into small pieces, in a bladder; or water, cooled by adding equal parts of muriate of ammonia and nitrate of potass. Sir A. Cooper has known the cold, produced by the evaporation of spirits of wine and water, succeed in reducing a hernia."—*Ibid.*

The best mode of using the tobacco injection is, "to infuse one drachm of tobacco in one pint of water, and of this one half should be first thrown up, and according to the effect produced in twenty minutes or half an hour, the other half may be injected or not. This is the safest plan of administering the tobacco."—*Ibid.*

What effect, or what symptoms ought the tobacco to produce?

423. "The effect to be wished for from the use of tobacco is a universal relaxation, so that the patient has not power to exert any of the voluntary muscles; when this is produced, a hernia may be sometimes reduced with very little force, after having previously resisted a firm and continued pressure. Under the influence of tobacco, a hernia, which has before its employment been tense, will become soft; and this is not occasioned by any partial reduction of the hernia, but only by the force of the circulation being for a time greatly diminished."—*Ibid.*

But are not the effects of tobacco carried to such an extent as sometimes to destroy the patient?

424. Yes; fatal instances from this remedy are but too frequently recorded by various authors; "but, prudently employed in the way that I have recommended, it is the most efficacious of the remedies proposed for the reduction of hernia."—*Ibid.*

Under what circumstances is the application of cold attended with danger to the patient, and therefore improper?

425. "It is improper to apply ice in such a manner that the patient or his bed-clothes become wet as the ice melts; it is also wrong to continue it upon the part for a long time toge-

ther, as it may occasion sloughing, as occurs from the effects of frost-bite."—*Ibid.*

Are purgatives useful in effecting the reduction of hernia in the generality of cases?

426. Purgatives used formerly to be very much given; but are now little employed. Calomel given by the mouth, and a strong enema of the compound extract of colocynth, sometimes are useful.—*Ibid.*

"If vomiting has already appeared, it may be allayed by opium and the effervescing draught, so as to allow a fair trial of the purgative. The most violent remedies of this description are not always the best in such a case. Epsom salt dissolved in a large quantity of water, and exhibited in small and repeated doses, does not offend the stomach, gently excites the action of the bowels, and is preferable to more drastic purges."—*Lawrence on Hernia.*

In what species of hernia are purgatives attended with the greatest probability of success?

427. "In large and old herniæ, where an accumulation of fecal matter, from torpor of the intestine, is the cause of strangulation, and the symptoms are of the chronic kind, purgatives may be employed with success; and those of an active description, such as jalap, or the compound extract of colocynth combined with calomel, are the best: the ordinary combination of Epsom salts and manna, with infusion of senna, is also well suited to such cases."—*Ibid.*

"Omental hernia is another exception to the general doctrine on the subject of purgatives. If we can clear the intestines completely, the operation will seldom be necessary: bleeding, the warm bath, and fomentations to the abdomen may be usefully combined in this case, with such means as will evacuate the bowels. As the tendency to sickness may render it advisable, in such a case, to exhibit the purgative in the form of pills, the union of calomel and the cathartic extract is well adapted for the purpose; for the same reason a combination of opium with these medicines may be serviceable."—*Ibid.*

What space of time would you expend in the trial of the above means before you resort to the operation?

428. "Our conduct must not be guided merely by the duration of the case; the kind of strangulation, the nature of the symptoms, the effect of the means employed, and the state of the parts, must influence our determination.

"Small and recent herniæ, or such as, having been kept up for a long time by means of a truss, are suddenly reproduced, admit of very little delay. The strangulation is violent in such cases, and inflammation and gangrene soon come on.

"In old and large ruptures, which have been often down and often replaced, the symptoms are not so urgent, nor the necessity of operating so strong."—*Ibid.*

Sir Astley Cooper says on this point, "It is extremely important that the operation should, if possible, be performed before the abdomen becomes tender under pressure. Distension of the intestines from flatus often produces tension of the abdomen soon after strangulation has occurred; but still, the patient can bear pressure without experiencing pain; but when he does complain of pain under pressure, it indicates the extension of inflammation to the cavity of the abdomen, which is likely to be much increased by the operation."—*Sir A. Cooper's Lectures by Tyrrell.*

What are the symptoms which will not allow of delay, and therefore immediately require the operation at your hands, whether any of the above remedies had been previously tried or not?

429. I shall reply in the words of Mr. Pott—"If the sickness becomes more troublesome, the vomiting more frequent, the pain more intense, the tension of the belly greater, the fever higher, and a general restlessness comes on which is very terrible to bear—when this is the state of the patient no time is to be lost: a very little delay is of the utmost consequence; and if one single remedy, which the disease is now capable of, be not administered immediately, it will generally baffle every other attempt. This remedy is the operation."—*Pott's Works.*

Do you not consider that a great majority of cases of strangulated hernia might be saved by an early operation?

430. Certainly; and although our practice is very much improved in this respect, doubtless a considerable number of cases are still lost for the want of such a decided conduct.*

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* I believe that I am justified in affirming that most of the cases, which are operated upon in the metropolitan hospitals of this country, terminate unfavourably from being sent to such institutions at so late a period of the symptoms. How important, therefore, is it that the general practitioners of the metropolis, as soon as they have expended a reasonable time in the application of the most suitable means of reduction, should (provided they decline the operation themselves) send the case without delay to an hospital, with the view to the operation being done under the most favourable circumstances—a conduct, which would probably save the lives of hundreds.

Are you of opinion that the operation, abstractedly speaking, is one of a dangerous nature?

431. A remedial wound of the peritoneum, carefully made, is not usually attended with fatal results. Those who die after this operation almost always fall victims to the consequences of the strangulation, and scarcely ever to those of the knife.

What are the symptoms of gangrene having taken place in the contents of the hernial sac?

432. "The occurrence of mortification is generally shown by the tumor losing its tension and becoming soft, so that it pits on pressure; the integuments, which are very red, become livid, and afterwards black in one or more spots, and the cuticle separates; the cellular membrane is emphysematous; the pain, vomiting, and hiccough cease; the pulse sinks and becomes irregular; the body is covered with a cold sweat; the countenance changes; the mental functions are disturbed; lastly, the integuments give way, and a discharge of wind and fecal matter in a highly fetid state ensues."—*Lawrence on Ruptures.*

If unequivocal symptoms of mortification have taken place would you feel justified in performing the operation?

433. Sir Astley Cooper states, that "there is scarcely any period of the symptoms, which should forbid the operation; for, even if mortification has actually begun, the operation may be the means of saving life by promoting the ready separation of gangrenous parts."—*On Inguinal and Congenital Hernia.*

Species 1.—*Hernia inguinalis strangulata.* Strangulated inguinal rupture.

What is the structure of the inguinal canal?

434. "The inguinal canal is bounded anteriorly by a superficial fascia from the abdominal muscles, and by the tendon of the external oblique; posteriorly, by the fascia transversalis and by the tendon of the transversalis muscle; above, by the edges of the internal oblique, and transversalis muscles; and below, by Poupart's ligament: the canal is about two inches in length, and terminates at the external ring."—*Sir A. Cooper's Lectures by Tyrrell.*

State the course of the spermatic cord, as it passes through this canal?

435. "The spermatic cord first quits the abdomen midway between the anterior superior spinous process of the ilium and

the symphisis pubis. It here passes between two layers of the fascia transversalis, the anterior layer of which is fixed in Poupart's ligament, whilst the posterior layer descends behind Poupart's ligament, and assists in covering the artery and vein, and in forming the crural sheath. Above the passage of the spermatic cord the two planes of the fascia unite and form a lining to the transversalis muscle, extending as far as the diaphragm. As the cord penetrates between these two planes, which form the internal ring, a thin layer of fascia unites it to the edge of each."—*Ibid.*

Mr. Lawrence somewhat differs on this point from Sir Astley Cooper. He says, "that the spermatic vessels, placed behind the peritoneum, descend from the loins, over the surface of the psoas and iliacus internus muscles, connected to them and to the membrane by loose cellular substance, and arrive at the division between the two portions of the fascia transversalis. Here they are joined at an angle, more or less acute, by the vas deferens; and the spermatic cord, which results from this junction, making a sudden bend inwards, passes through the opening, and consequently under the fleshy margin of the obliquus internus and transversus—the exact situation of its passage being marked by a slight depression of the peritoneum. It then goes obliquely downwards and inwards, *between the fascia transversalis and the aponeurosis of the external oblique*, being increased in size by the addition of a few thin muscular fibres, called the cremaster muscle, derived from the lower edge of the internal oblique and from the crural arch. The cord finally emerges through the opening in the tendon of the obliquus externus, and then turns suddenly downwards."—*Lawrence on Ruptures.*

What is the situation of the epigastric artery, relatively to the inguinal canal?

436. "This artery is situated from one-fourth to one-half an inch upon the inner side of the internal abdominal ring, or passage of the spermatic cord from the abdomen, and it passes to the inner part of the rectus muscle."—*Sir A. Cooper's Lectures by Tyrrell.*

What is the relative situation of the external iliac vessels to the internal inguinal opening?

437. The external iliac artery and vein are directly behind this internal abdominal aperture.—*Ibid.*

What is the structure of the external abdominal ring?

438. The external abdominal ring is formed by two columns of the tendon of the external oblique muscle, united by fibres

from Poupart's ligament. The upper column is inserted into the symphisis pubis; the lower column into the tuberosity of the pubis. The pubis bounds the opening below. Between these columns the spermatic cord passes, and from the edge of the ring, as well as from the surface of the tendon of the external oblique muscle, a thin fascia descends, uniting the cord to the edges of the opening, and passing down upon it to the tunica vaginalis: this fascia is then situated between the skin and the cremaster muscle, which muscle arises within the inguinal canal, from the internal oblique muscle: it descends with the spermatic cord, and passes through the external abdominal rings, spreading over the fore and lateral parts of the cord as far as the tunica vaginalis, into which it is inserted." —*Ibid.*

Is the description of these parts the same in the female?

439. Yes; but there, the round ligament of the uterus supplies the place of the spermatic cord; and the opening in the external oblique is considerably smaller.—*Lawrence on Hernia.*

How many kinds of inguinal hernia are there?

440. Three:—1. It may penetrate the upper opening, and afterwards, having traversed the canal, make its appearance through the ring of the external oblique.

2. It may enter the upper opening and remain in the canal without continuing its course through the lower one.

3. It may come directly through the inferior aperture without passing along the canal.—*Lawrence on Hernia.*

The two first are called external or oblique inguinal hernia; the last internal or direct.

With what other swellings may this species of rupture in a state of strangulation be confounded?

441. It is scarcely possible that a strangulated hernia, of whatever kind, accompanied by its proper symptoms, can be confounded with any other swelling; but those, which it is said may be mistaken for inguinal hernia, are hydrocele of the tunica vaginalis testis, and of the spermatic cord, circocele, and the descent of the testicle.

How would you discriminate between hydrocele of the tunica vaginalis and an inguinal hernia?

442. "If we see a swelling of the scrotum uniform on its surface, which commenced below and gradually ascended; if we cannot feel the testicle, but are able to discern the spermatic cord of its natural size, and in a healthy state above the tumour; and particularly if we can distinguish a fluctuation

or discover a degree of transparency in it, we are confident that such swelling is caused by an effusion of fluid into the cavity of the tunica vaginalis testis. We conclude that the case is a rupture when the swelling began at the ring and gradually descended; when the spermatic cord cannot be felt, but the testicle may be distinguished; and when the symptoms described above as belonging to a rupture, exist at the same time." —*Lawrence on Hernia.*

But may not a hydrocele extend so high as the ring itself, be so tense as to be devoid of fluctuation, and thus obscure the diagnosis?

443. It may; but "the origin of the tumour below, and its gradual ascent; its being constantly of the same size, and the impossibility of distinguishing the testicle, show that the case is a hydrocele; the uniform surface of the swelling, and the partial passage of light through it when a candle is held close, are further proofs of the same point."—*Ibid.*

How would you distinguish a congenital hernia, where the testis cannot be discovered, from hydrocele?

444. "Here, the continuation of the swelling into the ring, the variation in the size of the tumour according to the position of the patient's body, its origin from above, and the impulse occasioned by coughing, will point out the existence of a protrusion. If the swelling has commenced below, and is invariable in its size, and if no impulse is felt on coughing, it is a hydrocele."—*Ibid.*

Would it not be difficult to distinguish a hernia from hydrocele of the spermatic cord?

445. "Here," certainly, "the swelling extends into the ring, and the position of the body affects its bulk, which may be partly diminished by pressure towards the ring. The origin of the tumour below leads to the distinction."—*Ibid.*

"If the hydrocele have emerged from the inguinal canal a transparency of the swelling will assist our diagnosis; but should the hydrocele not have so emerged, or should the hernia be omental, our difficulties will be very much increased." —*Sir A. Cooper and Scarpa.*

May not a watery cyst in the spermatic cord be mistaken for inguinal hernia?

446. The want of connexion with the abdomen, the fluctuation, the invariable size, and the uniform surface of the tumour, will sufficiently distinguish a cyst of this kind from inguinal rupture.

How would you distinguish an inguinal rupture from a varicose spermatic vein, commonly called circocele?

447. The peculiar feel and convoluted shape of the latter will be almost sufficient at once to characterise it; if not, let the patient be placed in the horizontal position, and pressure be made with the finger along the swelling towards the abdomen, so as to evacuate the vein; then let pressure be made upon the ring, but not so as to obstruct the action of the spermatic artery: if the vein fill again from the bottom, it is circocele.

State the diagnosis between hernia and a late descent of the testis.

448. " The absence of the testis from the scrotum, together with the peculiar sensation excited by pressing the tumour, sufficiently discriminate the case of a testicle on its descent."*—*Lawrence on Hernia.*

What are the distinguishing external marks between a direct or internal, and an oblique or external inguinal hernia?

449. " The distinguishing marks between the direct and oblique inguinal hernia are the situation of the spermatic cord and the direction of the tumour. In the first, the spermatic cord is on the outer and upper part of the swelling; and the swelling may be traced in a direction towards the umbilicus. In the latter, the spermatic cord is situated behind the hernia, and the inclination of the tumour is towards the spine of the ilium."—*Sir A. Cooper's Lectures by Tyrrell.*

Are there not exceptions to the spermatic cord being situated behind the hernial sac in external inguinal hernia?

450. " The spermatic cord sometimes deviates from the course now described. Le Dran, Schmucker, and Mr. Blizard, have seen it lying in front of the sac. In other instances its component parts have been separated by the tumour. The vas deferens has passed on one side of the sac, while the spermatic vessels ran on the other; or the former has been seen on the anterior and inner, while the vessels were placed on the posterior and outer part of the swelling. In other instances the vessels have been before, and the vas deferens behind, the sac."—*Ibid.*

What is the situation of the epigastric artery in relation to the hernial sac in external inguinal hernia?

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* I have lately met with a case in which the testicle was at the ring at the age of 24. It exactly resembled an internal bubonocele in appearance, but the true nature of the swelling could be readily recognised by the above marks.

451. It is situated first behind the neck of the sac, and then on its inner side.

State more particularly what is signified by an internal inguinal hernia.

452. The space between the two columns of the aponeurosis of the external oblique muscle, through which the spermatic cord quits the inguinal canal, is closed behind by the fascia transversalis, connected to the tendon of the transversalis and obliquus internus, near its insertion into the pubes and the outer margin of the rectus muscle. The internal inguinal rupture occurs at this point, protruding under the transversalis, and presenting itself at the lower opening of the inguinal canal.

What is the situation of the spermatic cord and epigastric artery in relation to this hernia?

453. " Since the spermatic cord lies on the outer column of the aponeurosis of the obliquus externus, and this rupture comes directly over the pubes, the former part is placed on the outer side of the sac, more particularly at the point of protrusion. But I have seen the cord behind the sac, as in the more ordinary form of the complaint. The epigastric artery is situated on the outside of the mouth of the sac. Its course is not at all disturbed by the rupture, and it is consequently found, as in the natural state, at about three-fourths of an inch from the upper and outer extremity of the lower opening of the inguinal canal."—*Lawrence on Hernia.*

At what points may the stricture be situated in external inguinal hernia?

454. " The cause of strangulation may exist in the upper aperture of the inguinal canal, or in the lower aperture, or in the neck of the sac. According to Sir A. Cooper the first is most frequent in recent and small hernia, the second in old and large ruptures; or a rupture may be strangulated by both openings at once."—*Ibid.*

Sir A. Cooper, moreover, states that stricture at the upper opening " is occasioned by the semicircular edge of the transversalis becoming thickened."—*Lectures by Tyrrell.*

Bertrandi directly asserts that the transversus and internal oblique sometimes cause strangulation.

Where is the seat of stricture in the internal inguinal hernia?

455. The tendon of the external oblique muscle, or the edge of the obliquus internus and transversus, may be the seat of stricture in the internal inguinal hernia.—*Ibid.*

Describe the different investments of an external inguinal hernia after it has emerged from the abdominal ring, beginning from the surface downwards?

456. The investments or coverings are,

1. The integuments with their cellular and adipose membrane.

2. A fascia continuous with the margin of the ring, formed of tendinous fibres from the aponeurosis of the external oblique muscle.

3. The cremaster muscle, covering the fore and lateral parts of the sac.

4. The hernial sac.

What are the investments, if the hernia should not have emerged from the abdominal ring, the rupture being external inguinal?

457. 1. The integuments with their cellular and adipose membrane.

2. The aponeurosis of the external oblique muscle.

3. The cremaster muscle.

4. The hernial sac.

What are the coverings or investments of a direct or internal inguinal hernia?

458. 1. The integuments with their cellular and adipose membrane.

2. The fascia of the cord.

3. The fascia and tendon of the transversalis.

4. The peritoneal sac.

What instruments, &c., are necessary to the performance of the operation for strangulated inguinal hernia?

459. Scalpels, dissecting forceps, probe, directors, common probe-pointed bistoury, and a bistoury cutting for a short space only; tenaculum, curved needles armed with ligatures, adhesive plaister, lint, mild cerate, linen compresses, a long bandage, and some pieces of soft sponge.

State the position in which the patient should be placed for the performance of the operation.

460. "The patient is to be placed upon a table, about three feet six inches in height, on his back; the shoulders should be raised, and the thighs a little flexed towards the body, so as to relax the abdominal muscles; the hams are to be brought to the edge of the table, so that the legs may be allowed to hang over it."—*Sir A. Cooper's Lectures by Tyrrell.* The feet should be supported on a chair; the thigh of the affected side should be gently turned inwards, and the hair shaved off from the surface of the tumour.

Describe the operation up to the division of the stricture.

461. "The operator being seated by the side of the patient, or between the lower extremities, makes his external incision, which should begin an inch above the external angle of the ring, and extend over the middle of the tumour to its lower part, if the rupture be small or of moderate size: in large tumours it will be sufficient to divide the skin of the upper half or two-thirds."—*Lawrence.*

This should be done with a single stroke of the scalpel; and if the external pubic artery be wounded and bleed freely, it should be secured at once. The aponeurosis of the obliquus externus should now be fairly exposed, and the fascia of the cord and cremaster muscle carefully divided, layer by layer, with the scalpel and dissecting forceps, till we arrive at the hernial sac. This should be opened with the greatest caution possible at its anterior and inferior part. The fluid, that is thrown out between the hernia and peritoneal sac, will generally prove a sufficient safeguard to the intestine; but in order to prevent the possibility of wounding it, the opening in the sac may be made by elevating it with the forceps or the finger and thumb, and dividing the apex of the portion, so raised, by the knife held horizontally; or it may be done with an appearance of greater adroitness by lightly scratching the sac with the point of the scalpel (the blade of which should be held almost transversely with relation to the axis of the tumour), till the fluid of the sac escapes.* The sac being penetrated, the opening may be enlarged by a probe-pointed bistoury, guided upon the finger or a director, till a sufficient part of the hernial cavity is exposed.

Is fluid always found effused into the hernial sac?

462. In almost all cases; indeed, in inguinal hernia there are but few exceptions.

Should no fluid be effused how would you know that you had penetrated the hernial sac?

463. "The blood-vessels of the intestine, and its smooth-

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* I have always opened the hernial sac in this manner, which, in my judgment, prevents much embarrassment to the young surgeon, and saves the patient much suffering and delay. I have more than once seen layer after layer dissected in endless succession till the by-standers have become tired, the operator perplexed, and the patient implored the surgeon to hasten the operation and release him from his protracted sufferings. Mr. Lawrence remarks, that "many surgeons are accustomed to make great use of the probe in this part of the operation. They thrust the blunt end of the instrument into the cellular substance, and divide with the knife what they have thus raised. This practice carries with it a great appearance of roughness and awkwardness."

polished surface, sufficiently distinguish it from the hernial sac, which has not these vessels, which is rather rough and cellular on its surface, and which is always connected to the surrounding parts; although these adhesions, in a very recent case, may be but slight."—Besides, when the sac is opened, a probe, or the finger, will pass freely in any direction within its cavity.—*Ibid.*

In what direction would you divide the stricture in inguinal hernia?

464. It is a general rule, that *in all cases of inguinal rupture* the stricture may be with perfect safety divided "directly upwards; that is, in a course parallel to the linea alba, as the artery can never be endangered by cutting in that direction." —"And the precise point at which the incision of the tendon should be made is at the middle of the superior margin of the ring; the artery can never be situated at this part, nor be exposed to danger, unless the incision be extended to a most unreasonable length."—*Ibid.*

With what instrument, and in what manner, would you divide the stricture at the upper orifice of the ring?

465. This should be done by a bistoury recommended by Sir A. Cooper, "which has a cutting edge extending only to a certain distance from the point." It must be introduced with the flat side towards the finger, until the probe-point has passed under the stricture; when it should be turned up, so as to bring its edge in contact with the margin of the transversus, and to divide that muscle to the required extent.—*Ibid.*

But should you find it impracticable to divide the stricture at this point in the manner recommended, what step would you take to effect it?

466. I should not hesitate to enlarge the ring of the external oblique.

Should the hernia be situated within the inguinal canal, how would you perform the operation?

467. In the same manner as has been recommended: but in this case the aponeurosis of the external oblique muscle must also be divided. Having brought this tendon into view, a small opening should be made in it, so that a probe or director may be introduced beneath it, which will enable us to divide it to a sufficient length. The edge of the transversalis and obliquus internus may be cut either upwards or towards the spine of the ilium, as the epigastric artery invariably lies on the inner margin of the mouth of the sac.

Having divided the stricture, what remains to be done?

468. " The last step of the operation consists in returning the protruded parts, which, if they are sound and not adherent, may be immediately performed. The limb should always be in a bent state during this part of the operation."—*Lawrence.*

Should the swelling consist of a very large old scrotal rupture, would you not adopt a different mode of operation?

469. Yes; the usual operation for inguinal rupture would not be advisable in a case of this kind.

State your reason for this opinion.

470. " The separation of the preternatural connexions is often very tedious and difficult; and the violence which must necessarily be inflicted in executing this part of the operation renders the subsequent occurrence of inflammation extremely probable. The extensive surface, which must be exposed by laying open the whole of a large hernial tumour, constitutes a source of great danger to the patient, who, in these cases, is generally advanced in years, and, therefore, less able to withstand an extensive inflammation and suppuration. We must remember, too, the impossibility, which sometimes occurs, of keeping the returned parts in the abdomen after they have resided for many years in a hernial sac."—*Ibid.*

What would be your method of operating in such ruptures?

471. " These reflections will induce us to adopt the practice of removing the stricture without opening the tumour. The operation will be performed by making an incision of two or three inches in length through the integuments over the abdominal ring. We then dissect down to the fascia, which covers the hernial sac, and make an opening in that fascia. This allows us to pass a groove-director under the tendon, and the probe-pointed bistoury may be conducted by means of the groove to the part, that requires division. If great difficulty should be experienced in accomplishing our object in this manner, a small aperture may be made in the sac, near the ring, which will enable the surgeon to divide the tendon with ease. When the parts are thus set free, they should be returned into the belly by pressure on the swelling, if adhesion do not prevent this; at all events, they generally admit of being replaced in part."—*Ibid.*

Species 2.—*Hernia femoralis strangulata.* Strangulated femoral rupture.

Describe the boundaries of the femoral ring.

472. " The space in question is bounded above and in front

by the crural arch; below and behind by the pubes; on the internal side by the thin border of the tendon; and on the outer or lateral aspect by the femoral vein."—*Lawrence on Ruptures.*

Is it through this opening that a femoral rupture protrudes?

473. Yes: "No instance of hernia under the crural arch has been hitherto recorded, except at the crural ring."—*Ibid.*

State the course in which the viscera descend.

474. "The viscera descend from the abdomen at first nearly in a perpendicular direction, and come into the hollow in front of the pectineus. Since the motions of the thigh, and the more close adhesion of the integuments to the subjacent parts, resist the increase of the tumour downwards, and the larger quantity of the cellular and adipous substance at the bend of the limb offers less resistance, it comes forward to the surface, so as to lie in general in front of the crural arch. For the same reason it extends outwards or towards the ilium, assuming an oblong shape, with the long axis parallel to the crural arch. In consequence of this structure, the body of the sac forms a right angle with the neck; and that part of it, which, if it had continued to descend in a strait direction, would have been the lowest part of the bag or the fundus, is actually the anterior portion."—*Ibid.*

For what other diseases may a femoral hernia be mistaken?

475. This kind of hernia may be mistaken for an enlarged inguinal gland, for psoas abscess, and perhaps for a varicose state of the femoral vein.

How would you distinguish a small femoral hernia from an enlarged inguinal gland?

476. The diagnosis may sometimes be difficult, especially should the hernia be omental, or should an enlarged gland coexist with a small femoral hernia;* but "the circumstances which attended the origin and progress of the tumour, together with its present state and symptoms, generally enable the surgeon to decide upon the nature of the complaint, although the sensible characters should be insufficient to lead to this discrimination. If it appear suddenly after a violent effort; if it

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* Sir A. Cooper mentions a case of this kind in which he discovered a tumour beneath the gland, and reduced it by the taxis.—*Lectures by Tyrrell.*

increase in consequence of exertion, and diminish or disappear on pressure, or in the recumbent posture; if an impulse be felt when the patient coughs, and intestinal affections have been caused by it, the case must be a hernia. An enlarged gland is generally larger than an incarcerated hernia; it swells imperceptibly and gradually; is invariable in its size, and causes no disturbance in the alimentary canal."—*Ibid.*

Let us suppose an extreme case. Should the patient be affected with all the constitutional symptoms of incarcerated hernia, without any perceptible swelling of the groin beyond that of an enlarged inguinal gland, would you feel called upon to resort to the operation of cutting down upon the femoral ring, in the event of your failing to relieve the symptoms by any other means?

477. If there were any outward sign, or any the least local feeling on the part of the patient in favour of the case being hernia, I should feel imperatively called upon to cut down cautiously upon the femoral ring, with the view to ascertain the true cause of the symptoms.*

What circumstances would enable you to distinguish between a femoral rupture and psoas abscess?

478. As this collection of matter is consequent upon "the formation of an abscess in the neighbourhood of the psoas

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* An elderly and decrepid female, ætat 78, became afflicted with frequent vomiting, complete constipation of the bowels, and all the constitutional symptoms of strangulated rupture. Upon examining the groins, no swelling could be discovered, except a slight degree of fulness in the left, which appeared to be occasioned by some inguinal glands evidently enlarged. She complained of no pain at the femoral ring, and could bear pressure without any complaint. There was, however, one circumstance that threw some light upon the obscurity of the cause of the disease. Upon inquiring whether she had felt any sudden sensation at this part, she replied, that she believed she had strained herself there in the act of passing a very costive stool. Under such circumstances I availed myself of the opinion of Dr. Mac Carogher, now one of the physicians of the Chichester Hospital, who concurred with me in the propriety of cutting down upon the femoral ring to ascertain if the symptoms arose from any protrusion at that point. The poor woman consented with great fortitude to the proposal, and I performed the operation in the manner recommended by Mr. Lawrence. Having divided the integuments, cellular membrane, &c., I exposed some inguinal glands which were very much enlarged, and which appeared to account wholly for the fulness of the groin; but upon dissecting cautiously down to the femoral ring, I had the gratification to find ample cause for the symptoms; viz. a small hernial sac, containing a knuckle of intestine, about the size and colour of a damson-plum—so small, indeed, that the opening of the sac (which did not contain more than half a drachm of fluid), and the division of the stricture was a task of no inconsiderable difficulty and hazard. The operation was attended with complete success.

muscle, the preceding pain in the loins, attended, perhaps, with shivering and other symptoms, and the absence of intestinal affections attendant on hernia, enable us to distinguish the nature of the complaint."—*Ibid.*

But might not a femoral hernia be mistaken for an inguinal?

479. Such a mistake may "arise from the femoral protrusion turning up over the crural arch or Poupart's ligament, and much attention is often requisite in making an examination before the surgeon can confidently decide on the true nature of the disease. The best marks of distinction, which I have observed, are—that the neck of the femoral hernia is below and to the outer side of the spine of the pubes, while that of the inguinal hernia is above the spine; also, by drawing down a femoral hernia, Poupart's ligament may be traced above it, which it cannot be, if the case be inguinal."—*Sir A. Cooper's Lectures by Tyrrell.*

How would you distinguish a varicose state of the femoral vein from femoral hernia?

480. Place the patient in the horizontal position. If the tumour subsides, and if, by making pressure upon the crural ring, the tumour fills again, it is an enlargement of the femoral vein.

What are the fascia connected with femoral hernia?

481. First. The crural arch, or Gimbernat's ligament—which is the broad insertion of Poupart's ligament.

Secondly. The iliac fascia—derived from Poupart's ligament, extending between the peritoneum and iliacus internus and psoas muscles, and, at the same time, passing through the ring to form the commencement of the posterior part of the sheath of the femoral vessels.

Thirdly. The fascia propria—which, according to Sir A. Cooper, takes its origin from the fascia transversalis, and passing under Poupart's ligament through the crural ring, becomes the anterior part of the sheath of the femoral vessels.

Fourthly. The "fascia lata—which has two attachments above, but becomes united below. One portion is joined to Poupart's ligament from the spinous process of the pubes to the anterior superior spinous process of the ilium, and passing downwards, covers the femoral artery and vein, the anterior crural nerve, and the muscles on the outer and fore part of the thigh. From its origin at the spine of the pubes a defined edge, called its falciform process, passes a little outwards and downwards in a crescentic form over the sheath of the femoral vessels, then curves inwards and a little upwards under the saphæna major vein, and is united to the second portion. This second portion is connected above with the ligament of the pubes, close to the insertion of the external oblique muscle; it then passes inwards and downwards upon the psoas, iliacus internus, and other muscles, to join that part, which I described as passing under the saphæna major vein."—*Sir A. Cooper's Lectures by Tyrrell.*

Fifthly. "The superficial fascia—which covers the external oblique muscle, is continued down over Poupart's ligament upon the thigh, where it is found of considerable density, and serves to keep the superficial and absorbent vessels in their proper situations."—*Ibid.*

Is not the opinion of Sir A. Cooper at variance with that of Mr. Lawrence with respect to the fascia propria?

482. Yes. Mr. Lawrence does not admit of the existence of the fascia propria; he considers it as consisting of condensed cellular membrane, and contends that the fascia lata constitutes the anterior part of the sheath of the femoral vessels. He says, "A small portion of the vein, on its inner side, is not covered by the falciform process; the sheath is here completed by a dense fibrous substance."—*Lawrence on Ruptures.*

Are the above mentioned fasciæ perfectly distinct, the one from the other?

483. No; we must "bear in mind that these are all inmately connected, and that the different names indicate parts of one continuous expansion."—*Ibid.*

What is the result of this connection?

484. That it "maintains all the parts in a condition of mutual tension, which is materially affected by the position of the thigh, in consequence of the attachment of the femoral aponeurosis to the crural arch. When the limb is extended, rotated outwards, and carried in the direction of abduction, the parts are in the greatest tension. The semilunar edge of the fascia, and the posterior border of the crural arch, which, at the point of their junction, form the upper boundary of the crural ring, are then found to press very closely on the finger passed into that ring; and the crural arch itself is drawn downwards as much as possible. By rotating the thigh inwards, bending it, and carrying it across the opposite limb, the parts are brought into the most complete relaxation, and the pressure on the finger is sensibly diminished."—*Ibid.*

What is the situation of the epigastric artery in relation to the neck of the sac in femoral hernia?

485. "The epigastric artery passes obliquely upwards and inwards on the outside of the hernial sac; and is situated at the distance of half an inch from the neck of that part. —*Ibid.*

Is the obturatrix artery ever endangered by the operation for femoral hernia?

486. Yes; "the obturatrix artery is frequently produced by the epigastric, in which case, it may either go on the outer side of the sac to the obturator foramen, or it may pursue its course along the inner margin. In the latter distribution, the neck of the sac would be surrounded by a large vessel in three-fourths of its circumference. The iliac vein is on the outside; the common trunk of the epigastric and obturator vessels would lie on the front, and the obturatrix artery itself would be found on the inner margin of the sac."—*Ibid.*

State the relative situation of the spermatic cord and the round ligament of the uterus to the hernial sac.

487. The spermatic cord and the round ligament of the uterus pass directly over the superior part of the swelling, and are not more than half an inch distant from the mouth of the sac."—*Ibid.*

By what part is the stricture occasioned in crural hernia?

488. By the thin posterior edge of Poupart's ligament, and continuous part of the fascia lata—according to Mr. Lawrence.

By the neck of the sac, or the fascia propria—according to Sir Astley Cooper.

What are the investments of a crural hernia?

489. 1. The integuments, with their cellular and adipous membrane.

2. The fascia superficialis.

3. The fascia propria, according to Sir A. Cooper; condensed cellular structure, according to Mr. Lawrence.

4. The hernial sac.

Is not a crural hernia sometimes covered by the fascia lata?

490. Yes: in the variety in which the parts are contained within the sheath of the crural vessels. "The swelling, in that case, is covered by the fascia lata; is consequently more obscure to the feel; and has not a defined edge."—*Lawrence on Ruptures.*

State particularly your method of using the taxis in crural hernia?

491. "In our attempts to reduce a crural hernia by means of the hand, the pressure must be accommodated to the peculiar course, in which the parts descend. As the crural

arch and the fascia of the thigh are so immediately concerned with this swelling, the precautions of bending the hip, turning the limb inwards, and carrying the knee over the opposite thigh, are perfectly necessary in order to relax these parts. The pressure must first be exerted downwards and backwards, to push the swelling off the surface of Poupart's ligament; and if the parts recede under the application of the force in this direction, it should be continued upwards, in order to make them pass under the crural arch."—*Ibid.*

Would you not feel yourself called upon to operate very early for a strangulated crural hernia, that could not be reduced by any ordinary means?

492. The following is the language of Sir A. Cooper, on this most important point: "Were I myself the subject of crural hernia, I should only try the effect of tobacco clysters; and, if they did not succeed, would have the operation performed in twelve hours from the accession of the symptoms." But, for myself, I should say that even half of this time would be sufficient, if judiciously spent, for the use of the taxis, and the trial of the most effectual means of reduction.—*Vide* 418.

Describe the mode of operating for crural hernia.

493. I would begin my incision an inch and a half above the femoral ring; and, cutting through the integuments only, carry it obliquely downwards and outwards to the lower part of the swelling. I should next cautiously divide the superficial fascia and the condensed cellular membrane contiguous to the hernial sac; and then, with the utmost care, and in the manner recommended in the operation for inguinal hernia, divide the sac:—lastly, the whole extent of the sac should be laid open by a probe-pointed bistoury, carried along the groove of a director.—*Vide* 461.

By what means, and in what direction would you divide the stricture?

494. This is by far the most critical part of the operation, and requires the greatest care and attention on the part of the operator. "If the knife be directed upwards and outwards, the epigastric artery is greatly endangered. If we cut straight upwards, the spermatic cord is exposed to risk. The latter source of danger does not, however, exist in female subjects, on whom the operation is performed in the great majority of instances. An incision of the most interior part of the stricture is free from all danger in the ordinary course of the vessels." The sac then being sufficiently divided, I should carry the fore-finger of my left hand down to the stricture,

and having introduced the tip, or even the nail, beneath the crural arch, a bistoury, probe-pointed, and cutting only to a certain distance from the point, is to be carried down with its flat side opposed to the finger, and its edge facing downwards. Having passed its probe end only beyond the stricture, it should be turned up, so that its edge may come in contact with the posterior border of the crural arch, and then be made to divide that part of it which lies nearest the pubes.*

Do you prefer the finger as a director?

495. As the stricture in femoral hernia lies very deep, the finger should ever be preferred, as it is a living and sensitive guide to the bistoury, and more effectually defends the intestine. In my judgment, a metallic director is a dangerous instrument in this case, and ought not, therefore, to be used.

Is there much difficulty in dividing the stricture?

496. None; the mere turning of the bistoury upon its back is commonly sufficient to divide the stricture, which instantly gives way.

Is there not great danger of wounding the intestine during the division of the stricture?

497. Certainly; and the operator cannot be too careful in assuring himself that no portion of intestine over-laps his finger, whilst he is dividing the stricture. Sir Astley Cooper relates a case in which the intestine was wounded in two places;—feculent matter was extravasated into the cavity of the abdomen, and the patient died.

Again: is there not some risk of wounding the obturatrix artery in dividing the stricture in the manner recommended by Mr. Lawrence, (viz.) by dividing the crural arch towards the pubes?

498. It must be allowed, that in the less frequent distribution, which has been described above (see 486) the obturatrix artery will be endangered; but "this is not suf-

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* Sir A. Cooper, contending that the stricture is not caused by Gimbernat's ligament, declares that there is no necessity for dividing it. He says, "A director should be very carefully introduced into the sac, anterior to its contents, and gradually insinuated under the stricture; and upon its groove the hernia-knife (before described) should be passed, with its cutting edge turned upwards and a little inwards towards the umbilicus, in which direction the stricture should be divided.—*Lectures by Tyrrell.*

In my own practice, the crural arch has been divided in the way advised by Mr. Lawrence, which instantly allowed of the return of the rupture. I have given Sir Astley Coooper's method, as some may be disposed to follow his mode of dividing the stricture, and his authority, in any point of surgery, must ever be respected.

ficient to induce us to exchange this for any other method, that has been hitherto proposed; as I know of none that avoids the vessel more certainly, while, in facility of execution, and in other advantages, this has the undoubted preference."—*Lawrence.* "It is calculated that this vessel does not lie on the inner side of the sac in femoral hernia, when it is given off from the epigastric, more than once in eighty times." And even then, if the stricture be divided in this direction to as small a distance only, as shall be compatible with the return of the gut, the artery may frequently escape.—*Ibid.*

In this mode of operating, we shall entirely avoid the spermatic cord and the epigastric artery, in the ordinary course of the vessel.

Should this artery be unfortunately wounded, and bleed profusely, by what means would you stop the hemorrhage?

499. By a needle and ligature; or, if this mode should not succeed, constant pressure may be made upon the vessel by the finger of an assistant.

Species 3.—*Hernia umbilicalis strangulata.* Strangulated umbilical hernia.

What do you understand by the term exomphalos or umbilical hernia?

500. "The terms, exomphalos, omphalocele, and umbilical hernia, are applied to that species of rupture, in which the abdominal contents are protruded through the opening in the linea alba, which transmits the umbilical vessels of the fetus, or in the immediate vicinity of that part."—*Lawrence on Hernia.* In infancy, the protrusion takes place in the former, and in the adult, in the latter of these situations.

At what part of the umbilical ring does a rupture take place?

501. "The point at which the hernia protrudes, is under the superior arch of the umbilical ring, close to the passage of the vein."—*Ibid.*

Do the umbilical vessels perforate the peritoneum at the navel?

502. Certainly not; "the peritoneum is as entire here as in any other situation of the abdominal parietes."—*Ibid.* The vessels pass between this membrane and the abdominal parietes.

Has the umbilical rupture always its proper hernial sac?

503. As the peritoneum is entire at the navel, it follows, that umbilical rupture is always possessed of its true hernial sac, formed by that membrane.

What are the investments of an umbilical rupture?

504. The common integuments—a superficial fascia—cellular and adipous membrane, and the peritoneum, or hernial sac.

Is not the umbilical rupture sometimes congenital?

505. Certainly; there is one kind of the umbilical hernia existing from birth, which, therefore, may be termed congenital. "It is even found in the youngest embryos."—*Lawrence on Ruptures.*

Is the anatomy of a congenital umbilical rupture in any respect different from that which occurs after birth?

506. No; it is, in all respects, of the same structure.

What is the treatment of a strangulated umbilical rupture?

507. The remedies will be the same as those recommended for the other kinds of strangulated hernia.—*Vide* 418.

But might not the symptoms of strangulated umbilical rupture be mistaken for the intestinal disorders, which so frequently take place in persons affected with this rupture?

508. Yes; "the surgeon should bear in mind, that the intestinal disorders, which occur so frequently in persons afflicted with this malady, particularly if it is old, large, and irreducible, are often severe, and assume an aspect more or less similar to that of strangulation."—*Ibid.* "We must remember also, that the immediate neighbourhood of the stomach, and its close connexion with the omental portion of the hernial contents, which is hardly ever wanting, expose that organ to irritation in various ways, and produce nausea and vomiting, quite independent of strangulation."—*Ibid.*

What treatment would be best suited to a case, which you had reason to suspect was one of this kind?

509. "In all cases, where we see reason to suspect that constipation or intestinal disorder of any kind, rather than incarceration, is the source of the mischief, active purgatives in small bulk, to avoid offending the stomach, will be most likely to afford relief. Calomel, in doses of five or ten grains, combined with opium, if the state of the stomach requires it, will answer our purpose best. It may be followed by small doses of Epsom salts at short intervals."—*Ibid.* "During the employment of these means, leeches, ice, or other cold applications, to the tumour, if it be inflamed or painful, will mitigate the local disorder, and often produce much benefit."—*Ibid.*

If these means, however, should not succeed in the reduction of the rupture, or in removing the symptoms of strangulation, what is the next mode of treatment you would adopt?

510. “If these internal and external means should not prove successful, the tobacco clyster still offers considerable chance of relief; in failure of which we must proceed to the operation.”—*Ibid.*

Does not the operation for strangulated umbilical rupture require even more care and caution than that for other kinds of rupture?

511. “The hand of a prudent operator will be guided by this maxim in every species of rupture; but the present case certainly requires more strict attention to such a precaution; since, in many cases, the integuments and hernial sac cannot be distinguished in the front of the tumour.” Besides, “the coverings of umbilical rupture are frequently very thin.”—*Ibid.*

But have you not a still greater reason for the caution you have recommended?

512. “The pressure of the contents in a large and old exomphalos, produces sometimes a more or less complete absorption of the sac;” so that, at such points, the sac will be found wanting, and the contained viscera adhering to the integuments.”—*Ibid.*

Describe the operation for strangulated exomphalos.

513. “The incision may extend longitudinally over the whole tumour, beginning half an inch or an inch above the opening in the linea alba; or it may resemble, in conformity with the advice of Sir A. Cooper, the letter ⊥ inverted; the longitudinal portion of the cut terminating in the middle of the swelling, and a transverse incision crossing the tumour at right angles with the former, so as to join its lower end. The stricture may be most conveniently removed by cutting upwards. No danger, indeed, can arise from giving the incision any other direction, as there are no blood-vessels of any importance in the neighbourhood. The curved blunt-ended bistoury, carefully conducted by the left fore-finger, which should protect the protruded parts, should be employed for this purpose. The edges of the incision should be carefully brought together after the operation, and united by sutures.”—*Ibid.*

Would you proceed in this manner in large umbilical ruptures?

514. “As the risk with which this operation is necessarily attended, makes it advisable to diminish the subsequent in-

flammation and irritation as far as lies in our power, I should be inclined to employ in a case of exomphalos, if the tumour exceeded a moderate size, that mode of operating, which I have described as applicable to large inguinal hernia; in which the tendon is divided without opening the sac; or the latter part is only cut sufficiently to allow the division of the stricture. This will permit the return of the parts, if they are not adherent; and if adhesions should have formed, the immediate cause of danger, the strangulation, is removed. —*Lawrence on Ruptures.*

But might not the circumstances of the case be sometimes such in large herniæ, as to oblige you to lay open the whole of the sac?

515. "In some instances where there has been an opening formed by absorption or laceration of the hernial sac, the intestine or omentum escapes from the sac, through the aperture, and becomes strangulated by the pressure from its edge."—*Sir A. Cooper's Lectures by Tyrrell.* Here it may be necessary to lay open the sac to such an extent as will enable us to divide the stricture.

Is the division of the linea alba always necessary to reduce the rupture?

316. No; in cases where the incarceration is caused by fecal accumulation, and where the operation is nevertheless necessary from the failure of every other remedy, it will be sometimes practicable, after having laid open the sac, to return the hernial contents into the cavity of the belly without cutting the linea alba—an omission that will ever be most fortunate for the patient.*

Species 4.—*Hernia congenitalis strangulata.* Strangulated congenital rupture.

In what respect does the structure of a congenital rupture differ from the common scrotal rupture?

517. "This case differs from the common scrotal rupture merely in the circumstance of the protruded parts being con-

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* This opportunity happened to myself and the late Mr. Blair. An elderly lady had long been afflicted with an irreducible umbilical hernia, which, at length becoming strangulated, required the operation. After having laid open the sac and divided a few adhesions, the contents of the hernia, which was an entero-epiplocele, were returned into the belly without dividing the linea alba. The operation was not followed by any untoward symptom, and the wound healed by the first intention with only one dressing.

tained in the tunica vaginalis testis, and consequently lying in contact with the testicle itself covered only by the tunica albuginea. The hernial sac is formed, therefore, by the vaginal coat of the testicle."*—*Lawrence on Hernia.*

Does this circumstance require any difference in the mode of operating?

518. None; but the operator, after having divided the integuments, the cellular membrane, and fascia superficialis, will be cautious in approaching the intestine through the tunica vaginalis; and this latter membrane "should be divided only as far as the upper end of the testis," that the testis may not be exposed.

By what part is the stricture occasioned in congenital hernia?

519. "The parts are often girded by a contraction of the hernial sac, not only where it communicates with the abdominal cavity, but also in other situations, where we should not have expected this occurrence. Mr. Wilmer informs us that he has generally found the stricture in these ruptures to reside in the neck of the sac, and not in the tendon of the external oblique; and Mr. Pott mentions an instance of remarkable narrowness in the upper part of the sac."

Suppose a rupture should be formed, "when the communication with the peritoneum is closed, but before the contraction has been continued from the abdominal ring downwards,"—what would be the difference in the structure of the swelling?

520. In this variety we should find a true hernial sac within the tunica vaginalis; and cases of this kind have occurred to Mr. Hey, and to Sir Astley Cooper.

SPECIES 5.—*Hernia ventralis strangulata et aliæ.* Strangulated ventral and other herniæ.

May not a protrusion of the viscera take place at other parts of the abdominal cavity?

521. "Certainly; and visceral protrusions at the anterior or lateral parts of the abdomen, except those already described, may be called ventral herniæ." When they take place through the opening in the ligament of the foramen ovale, by which the obturatrix artery, &c. pass to the thigh—thyroideal hernia;

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* The congenital hernia "may be distinguished from common scrotal hernia by the impossibility of feeling the testicle, which part can be clearly felt in those cases. The existence of a rupture from infancy affords also a strong suspicion that it is of this kind."—*Lawrence on Hernia.*

when between the vagina and ischium—pudendal hernia; when between the uterus and rectum—vaginal rupture; when between the bladder and rectum in the male subject—a perineal rupture; when through the ischiatic notch—an ischiatic rupture.

What have you to say on the treatment of these ruptures in a state of strangulation?

522. These cases are of rare occurrence; but when they do occur, they require to be treated upon the same principles and by the same means as those laid down for other ruptures; and should an operation become necessary for the removal of the stricture, such an operation must be conducted by an accurate knowledge of the anatomy of the parts, and with the greatest care and caution; and the stricture must be divided in that direction, as shall the least endanger the well-doing of the patient.

THE RETURN OR DISPOSAL OF THE HERNIAL CONTENTS.

Having laid open the sac, exposed the contents of the hernia, and divided the stricture, what remains to be done?

523. To return the protruded parts, which may be effected at once, if they are sound and not adherent. In an entero-epiplocele the intestine ought to be replaced first, and afterwards the omentum. A distended state of the gut sometimes forms an obstacle to its reduction. "If a distended intestine can be emptied by gentle pressure, its return will be facilitated; but if this cannot be effected without violence, it will be right to enlarge the division of the stricture."—*Lawrence on Ruptures.*

Should the contents of the sac be sound, and their return prevented by adhesions, how would you treat the case?

524. When these adhesions are recent and tender, they may admit of being lacerated by the finger; if they have acquired firmness, they should be destroyed by the knife," and "the surgeon should make it a rule to destroy every preternatural connection before he returns the part: the agglutination of the two sides of a fold of intestine, has caused a sufficient obstacle to the passage of the alimentary matter to induce a fatal termination."—*Ibid.*

Are there not exceptions to this rule?

525. The rule does not apply in cases of old large herniæ; where we must be content to remove the stricture without the return of the contents of the sac; nor does it hold

good where the intestine has become so attached to the neck of the sac, as to render the division of the adhesions either impracticable, or perilous to the patient. It the latter instance, "we should be very careful to make the parts quit free from pressure, and then cover them by gently approximating the integuments."—*Ibid.*

Has it ever happened, that a portion of intestine thus left adherent to the mouth of the sac, has, in the course of the cure, retired into the belly?

526. This fact is recorded by Mr. Lawrence, but "if a small portion remains below the ring, it is covered by granulations, and of course adheres to the cicatrix."—*Ibid.*

You say, that the parts may be returned into the belly, if sound; what are the kinds of unsoundness that would prove an adequate objection so their being returned?

527. A diseased or gangrenous state of the parts.

What would be your treatment of a diseased state of the omentum?

528. Whatever part of the omentum may be found to have undergone a change of structure, ought to be amputated; but the surgeon should take care to ascertain previously, that no portion of intestine be enclosed in that part of the omentum about to be removed.

Having removed the morbid part of the omentum, would you feel yourself justified in enclosing by ligature the root of the tumour to prevent hemorrhage?

529. This would be a most absurd and pernicious practice, and would reproduce the very cause, for which alone the operation was performed, viz. strangulation. If any vessels bleed after the removal of a part of the omentum, they ought individually to be secured by ligature, one end of which should be retained, so that it may hang out of the wound. This being done, the omentum should be returned into the abdomen.

Would it not be better to suffer the end of the omentum to lie at the mouth of the abdominal opening?

530. This practice would "be attended with no particular advantage, but certainly expose the patient to the possibility of bad consequences. The omentum left in the wound must be liable to injury, inflammation, or disease. Unnatural adhesions, formed by this part, have greatly impaired the functions of the stomach. Cases are on record, where the unfortunate patient has never been able to take more than a certain quantity of food, without bringing on instant vomiting; and even

where it has been necessary for all the meals to be taken in the recumbent position, with the trunk curved and the thighs bent."—*Lawrence on Hernia.*

What are the appearances of gangrenous omentum?

531. If the omentum be in a state of gangrene, it may generally by known by its crispy feel, and the distension of its veins by coagulated blood.—*Sir A. Cooper's Lectures by Tyrrell.*

What would be your conduct, supposing the omentum to be of a suspicious appearance?

532. "If any suspicion arise of its being in an unsound state, it should be removed by excision at the sound part; for should the omentum, in an unsound state, approaching to gangrene, be returned into the cavity of the abdomen, the danger of the patient will be much increased."—*Ibid.*

Again: what would be your treatment of an adherent omentum?

533. "When the omentum alone adheres to the sac, it may be freely separated and returned, any vessels likely to afford a troublesome hemorrhage, being previously secured."—*Ibid.*

How would you distinguish incipient gangrene from a dark discolouration of the intestine?

534. "In order to determine whether a discoloured portion of intestine be actually mortified, we are recommended to press forward the blood contained in the veins; and if they fill again, it is considered as a proof that the part still retains its vitality. On the contrary, if it appears that coagulation has taken place, we may infer that the part is gangrened."

"The discolouration which I now allude to, consists of a dark brown, or chocolate tint; it is probably caused by the vessels being distended with venous blood, in consequence of the pressure of the stricture. The colour of gangrene is black. In the former case, the coats retain their healthy structure: in the latter, they are flabby and give way under the finger."—*Lawrence on Ruptures.*

In gangrene, there is a peculiar cadaverous odour, when the intestine is exposed. A sure criterion of mortification, says Mr. Travers, may be found in that loss of lustre, which accompanies the death of polished membranous surfaces, which alters the complexion of the peritoneum as it does of the cornea.

What would be your treatment of the intestine, where a small spot only has mortified?

535. "We should replace it in the cavity of the abdomen

with the mortified portion towards the wound, and await the result of the operation of nature without interference."—*Ibid.*

But do you not fear that an effusion of fecal matter would take place into the abdominal cavity?

536. No; "the inflammation, which precedes the mortification of the intestine, is found to extend along the canal, and to agglutinate the neighbouring parts to each other, and to the abdominal parietes. Thus the returned gut is mechanically confined to the neighbourhood of the ring, and a complete barrier is opposed to its removal from that part. We may then safely conclude, that the alimentary matters effused from a mortified intestine, will find their way through the wound, and not be spread over the cavity."—*Ibid.*

How would you treat a case of mortified hernia, where a part only of the tube has been strangulated?

537. "Let a free incision be made through the mortified part of the gut in order to procure that evacuation of the loaded canal, which nature attempts by the process of gangrene."

"If the intestine had already given way, a free division of the integuments and sac allows the exit of the accumulated matter; and the opening in the gut may be enlarged, if it be not already sufficient."—*Ibid.*

In a rupture of this kind, is it necessary to divide the stricture?

538. Mr. Travers says, that such division, in this case, is unnecessary, "for the bowel is already relieved, at the expense of its life indeed, by the natural process of mortification."

"If the feces issue freely, it is all we can wish; should the stricture be so narrow as to interfere with this discharge, a small incision will afford the requisite room: to ascertain this point, and also to discover whether there be any interior constriction, let the end of the little finger or a fenule catheter be cautiously introduced into the bowel."—*Lawrence on Ruptures.*

What means would you adopt to restore the continuity of the intestinal canal?

539. "The aid of art can do nothing towards restoring the continuity of the canal, and the natural course of the intestinal contents. The strongest proof of wisdom in the surgeon will be to abstain from all means that might interrupt the salutary operations of nature."—*Ibid.*

What would be your conduct, where the whole diameter af the intestine is in a state of mortification?

540. Under these circumstances, the stricture should be divided, after which a free incision should be made into the gangrenous intestine, to allow of the escape of its contents.—*Sir A. Cooper's Lectures by Tyrrell.*

The subsequent progress of the cure should be left entirely to nature.—*Lawrence.*

Should the patient recover from this alarming condition, what are the local results?

541. The result of mortification of the intestine, is too frequently that of a permanent fecal discharge; and, "when we consider the loose state of the intestinal canal, in its natural condition, we find a difficulty in conceiving how its continuity can be restored after considerable portions have perished; yet indubitable proofs of this fact exist, and induce us to place confidence in the resources of nature."—*Ibid.*

Should the intestine be found not adherent to the peritoneum, would you adopt any method to retain the open extremities near the ring?

542. "La Peyronie has advised that, after the removal of the dead portion, a ligature should be placed in the mezentery so as to draw this part into a longitudinal fold, and thereby approximate the two ends of the gut. He fastens the ligature to the outside of the wound in such a manner as to retain the open extremities near the ring. The successful event of some cases treated on the above plan, seems to justify the principles on which it is founded. If, indeed, its employment be restricted to those cases in which the intestine is perfectly inadherent (which are, I am convinced, of extremely rare occurrence) it is not liable to any objection; and certainly possesses the merit of retaining the ends of the intestine in such a relative situation, as must facilitate their union."—*Ibid.*

What general treatment is necessary in cases of mortified hernia?

543. "Whether the intestine should have given way spontaneously, or have been opéned by the surgeon, mild purgatives and clysters will be proper to unload the bowels, and to determine the course of the feces towards the anus. The use of both these means, with the latter object, constitutes a very important part of the treatment of mortified intestine."—*Ibid.*

Suppose, from the great degree of constriction that has taken place, you should have reason to suspect that the coats of the intestine were so far ulcerated through, that on their *return into the belly, fecal effusion may speedily take place, what would be your treatment?*

544. "Let the operator then observe the rule of gently drawing out the bowel, after liberating it from the stricture, so as to ascertain its state. If he see no reason to apprehend perforation of the tube, he will replace the intestine in the usual manner; on the contrary, should this point appear doubtful to him, let him leave the part on the outside rather than expose the patient to the irremediable danger of effusion into the belly."—*Ibid.*

Should the operator have the misfortune to wound the intestine, so as to allow of the escape of its contents, what measures ought to be taken?

545. The aperture being closed and held up by the points of a pair of forceps, a fine silk ligature is to be carried beneath the instrument, tied upon the gut, and cut close; after this the intestine may be replaced. A case of this sort was successfully treated by Sir A. Cooper.

Having then performed the operation for strangulated hernia, and replaced the intestine in a sound state, what remains to be done previously to the closing of the wound?

546. "The finger should be passed in after the replacement, to ascertain that the ring is free, and that the viscera have completely re-entered the abdominal cavity. The cases, in which the protruded viscera have been returned still constricted by the neck of the sac, and others, in which they have been thrust up between the peritoneum and muscles, render this precaution very necessary."—*Lawrence on Hernia.*

What is the treatment of the wound after the return of the hernial contents?

547. "It is generally necessary to retain the lips of the wound in apposition, by means of one or more points of the interrupted suture, particularly when the scrotum has been divided. In the intervals between these, they should be still further approximated by strips of sticking-plaister. Moderate pressure on the neck of the sac, by means of a compress, secured by a spica bandage, may promote the agglutination of the sides, and prevent any protrusion."—*Ibid.*

Lastly—What is the constitutional treatment after the operation under ordinary circumstances?

548. "In all cases it is useful to solicit the action of the intestines by means of common clysters, and small doses of Epsom salts dissolved in infusion of roses or mint-water."—*Ibid.*

A light and spare diet is absolutely necessary; and the patient should be directed to avoid every exertion that may tend in the slightest degree to occasion a fresh protrusion.

ORDER III.—*Vulnera propria abdominalia.* Wounds proper to the abdomen.

GENUS 1.—*Vulnus superficiale.* Superficial wound of the abdomen.

What is the treatment of superficial wounds of the abdomen?

549. Wounds through the integuments only are to be treated upon common principles; and should the abdominal muscles be cut, the thorax and pelvis ought to be raised, so that the wounded muscles may be relaxed and their edges brought in contact; after which the union may be preserved by adhesive plaister, compress, and bandage.

Is there any specific reason for the application of a compress in this kind of injury?

550. A compress is particularly necessary to prevent the occurrence of hernia.

What are the ill effects most to be apprehended in wounds of the abdominal parietes?

551. Inflammation of the peritoneum.

By what means is this to be prevented?

552. By the rigorous employment of the antiphlogistic treatment.

GENUS 2.—*Vulnus viscerum abdominalium.* Wound of the abdominal viscera.

Should you be called to a person who had been stabbed in the region of the abdomen, and the appearance of the wound, without being accompanied by any positive proof of the fact, should lead you to suppose that it had penetrated the belly, would you feel justified in probing the wound till you had ascertained the real nature of the case in this respect?

553. Decidedly not; as such information would in this instance be unproductive of any practical advantage; and as the officious examination of such a wound might be highly prejudicial to the patient. Without delay the wound should be closed, and such treatment adopted as shall be best calculated to prevent inflammation of the peritoneum.

Relate the circumstances, that would at once prove the wound to have penetrated the cavity of the belly.

554. The protrusion of the omentum, bowels, or any of the abdominal contents; the discharge of feces, bilious matter or chyle from the wound; and the passing of blood by vomiting or by stool.

Would external hemorrhage lead you to infer that the abdominal cavity had been penetrated?

555. "When a considerable quantity of blood issues from a wound of the abdomen we may pronounce, almost with certainty, that some large vessel within its cavity is wounded."—*Dictionary of Practical Surgery.* At the same time it is possible that the hemorrhage may be derived from the epigastric artery, and not from the cavity of the belly.

What are the symptoms of internal hemorrhage?

556. "Extreme debility and faintness; faultering of the pulse; cold sweats; and if the bleeding should not speedily cease, the symptoms are soon followed by death."—*Ibid.*

Would the escape of urine from the wound prove that the cavity of the belly had been penetrated?

557. Our decision on this point would very much depend upon the situation of the external wound. Should this be situated above the pubic region there would be reason to suppose that the bladder had been wounded through its peritoneal coat. On the contrary, should it be in the pubic region, we may conclude that the abdominal cavity had not been penetrated.

How would you treat a gunshot or punctured wound that has penetrated the cavity of the belly, without wounding, apparently, any of the viscera?

558. The wound should be speedily closed with adhesive plaister, as has been before recommended; the abdominal muscles relaxed by a suitable position; the bowels emptied by frequently repeated oleaginous clysters; the most antiphlogistic diet observed; and the first symptoms of approaching inflammation met by topical and general bleeding, fomentations, and the warm bath.—*Hennen's Principles of Military Surgery.*

What treatment would you adopt in a wound of the abdomen, accompanied with a protrusion of the intestines?

559. Should "the protruded parts be covered with sand, dust, or other extraneous matter, they should be tenderly washed with a little tepid water," and, if in a sound state, be instantly returned.—*Cooper's Dictionary of Practical Surgery.*

Suppose the external wound to be too much contracted, or the intestine too much inflated to admit of the return of the protruded parts; by what method would you accomplish the reduction?

560. " Under these circumstances the dilatation of the wound is indispensable; however, when the reduction seems almost a matter of impossibility, on account of the smallness of the wound, if the surgeon be careful to relax the abdominal muscles, draw a little more intestine out of the wound, and gently press the contents of the bowel through the constriction into the abdomen, he will frequently succeed in reducing the parts without using the knife."—*Dictionary of Practical Surgery.*

Should a division of the constriction be absolutely necessary, in what direction ought it to be made?

561. " When such operation is unavoidable, the dilatation should be made in a direction, which will not endanger the epigastric artery, and, if possible, in the same line as the muscular fibres."—*Ibid.*

Is there any method of detecting the positive situation of the epigastric artery, before we proceed to the dilatation of the wound?

562. Yes. Should the wound be situated near any of the principal trunks of the vessel, it may be detected by pulsation. On this account the finger is the best director for the bistoury.

Do you approve of puncturing the intestine instead of dilating the parietes of the abdomen, in order to the reduction of the protrusion?

563. Decidedly not; such a method would not only be ineffectual, but in the highest degree dangerous to the patient, already in a most perilous situation.—*Mr. Travers' Work on Injuries of the Intestines.*

In what order would you return an entero-epiplocele-protrusion?

564. First, the mesentery; secondly, the intestine; and lastly, the omentum.

Should the protruded intestine exhibit such a dark colour as to justify a suspicion that it was running into gangrene, would you return it?

565. Yes; for though " the dull, brown, dark-red colour of the intestine may induce the practitioner to suppose either that the part is already mortified or must inevitably become so, and, consequently, he may delay returning it into its natural situation;" yet, " notwithstanding this suspicious colour of

the intestine, its firmness will evince that it is not in a state of gangrene;" and, therefore, although "the ultimate recovery of a portion of intestine, so circumstanced, is always a matter of uncertainty, the propriety of speedily replacing the part in its natural situation is a thing most certain."—*Cooper's Dictionary.*

Should you find the bowel in a state of gangrene, what would be your treatment?

566. Mortified intestine from wounds is a rare occurrence; but should the bowel be positively gangrenous, the case ought to be treated in the manner recommended for mortified hernia. See 534 and the following numbers to 543.

Is the effusion of feces, bile, blood, &c., into the peritoneal cavity a frequent occurrence, as the result of abdominal wounds?

567. We learn from the vast experience of military surgeons in the late wars, as well as from the researches and experiments of scientific surgeons, that this is by no means so frequent an occurrence as was supposed by the older surgeons.—*Hennen's Military Surgery, and Travers on Injuries of the Intestines.*

Does the structure of the abdomen satisfactorily account for this?

568. Yes; the cavity of the abdomen is so completely and accurately filled by its viscera, and the viscera again so closely supported by the abdominal and respiratory muscles, that "the effused matters, being poured out in opposition to considerable resistance, are collected in one spot, in which they become confined by the inflammatory agglutination of the contiguous parts, and where they form what the French call a depôt."—*Lawrence on Ruptures.*

Under what circumstances would extravasation of the intestinal canal probably take place?

569. The contents would probably escape, if the wound should be large, lacerated, or longitudinal, and more especially if the bowel should be full.—*Ibid.*

What are the symptoms, by which you would conclude that fecal extravasation had taken place?

570. Considerable pain and swelling of the belly; convulsive startings, and hiccough and vomiting.—*Sabatier Med. Opératoire.* Added to these there would be cold sweats, syncope, &c.

What are the diagnostic marks of an extravasation of blood into the peritoneal cavity of the abdomen?

571. "Blood generally makes its way downwards, and accumulates at the inferior part of the abdomen, unless the presence of adhesions happen to oppose the descent of the fluid to the most depending situation. The belly swells, and a fluctuation is perceptible; the patient grows pale, loses his strength, is affected with syncope, and his pulse becomes weak and scarcely distinguishable. In short, the symptoms, usually attendant on profuse hemorrhage, are observable."—*Cooper's Surgical Dictionary.*

Might not bile also be effused into the peritoneal cavity from a wound of the abdomen?

572. Certainly; and cases are recorded to prove the fact. One was communicated by a Dr. Stuart to the Royal Society of London; another is mentioned by Sabatier; and a third will be found in the fourth volume of the Medico-Chirurgical Transactions, which occurred in the practice of Mr. Fryer, of Stamford. The symptoms were distension, pain, vomiting, difficult respiration, coldness of the extremities, pallor of the countenance, and a very weak pulse.

What is the treatment of abdominal effusion from external violence?

573. Dr. Hennen in condemning the practice of searching after effused fluids, says, "I have never witnessed a case, where any possible good effects could follow the paracentesis; for peritonitis, in its most exquisite form, has always preceded the symptoms, which would lead to the performance of the operation. I by no means, however, would deny the possibility of the occurrence of effusion, and its relief in this way;* for from Vachen, Petit, and other good authorities, we know that it has happened; but in the military hospitals, to which I have had access, effusion has been invariably fatal."—*Principles of Military Surgery.*

What is the treatment of a manifest wound of the intestines?

574. John Bell says, "When there is a wounded intestine, which we are warned of only by the passing out of the feces, we must not pretend to search for it, nor put in our finger, nor expect to sew it to the wound; but we may trust that the universal pressure, which prevents great effusion of blood, and collects the blood into one place—that very pressure which always causes the wounded bowel, and no other, to protrude—

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* Mr. Fryer's case, quoted above, was treated successfully in this manner. In this instance, however, it appears that no examination was made of the nature and composition of the fluid extravasated. Might not this have been a serous effusion?

will make the two wounds, the outward wound and the inward wound of the intestine, opposite to each other, point to point; and if all be kept there quiet, though but for one day, so lively is the tendency to inflame that the adhesion will be begun, which is to save the patient's life."—*Discourses on Wounds.*

But should the wounded bowel lie within our reach, and the wound be so small as to be closed by the protrusion of the villous coat, how would you treat the case?

575. The wound should be closed as if no such lesion had taken place.

Supposing, however, the breach in the intestine to be small, yet sufficient to let the feces escape, what method ought to be adopted?

576. In such a case " the surgeon, including the aperture in his forceps, should cause a fine-silk ligature to be carried beneath the point of the instrument, and firmly tied upon the gut, as was advised at 545 for a wound of the intestine in the operation for hernia.

Would you cut off both ends of the ligature close to the knot, and return it into the abdomen with the intestine; or remove one end only, and suffer the other to hang out of the wound?

577. " It appears that, when the first practice is followed, the remnant makes its way into the intestine, and is discharged with the stools without any inconvenience. But when the long ends are drawn through the outer wound and left in it they materially retard the process of healing." — *Travers on Injuries of the Intestines.*

Should the protruded intestine be partly cut through, or should the whole diameter of the gut be divided, how would you treat the case?

578. " If a case were to present itself to me in which a bowel, partly cut through, protruded, I should apply only a single suture, made with a small sewing-needle and a piece of silk. If the bowel were completely cut across I should have no objection to attach its ends together by means of two or three stitches of the same kind."—*Cooper's Dictionary.*

But would you not prefer the uninterrupted to the interrupted suture, where the intestine is completely cut across, so that the whole circumference of the bowel may be brought into contact?

579. It appears from the experiments made by Sir A. Cooper, Dr. Thomson, of Edinburgh, and Dr. Smith, of Philadelphia, that the greatest share of success lies on the side of the interrupted suture.

Suppose the gut to be completely severed, with the upper end lying out of the wound, and the lower concealed within the cavity of the abdomen, would you stitch the upper end of the wound so as to establish an artificial anus?

580. No; having returned the protruded portion to the outer edge of the external orifice, it will be better to cover the wound with mild dressing, to keep the patient in one posture, and, under these circumstances, to leave the reparation of the intestinal canal to the disposal of nature.

What is the general treatment of the patient after wounds of this kind?

581. "In the generality of injuries of the abdomen from external violence, whether wounds or contusions, the principal danger depends upon inflammation of the peritoneum. In the treatment, therefore, the most necessary thing is to prevent and oppose this perilous affection. Copious and repeated venesection, the application of leeches, mild aperient glysters, a low fluid diet, perfect rest, fomentations, and the warm bath, are amongst the most effectual antiphlogistic remedies, which, in such cases, are entitled to praise and confidence."—*Ibid.*

What is the treatment of wounds of the stomach?

582. The stomach, being part of the alimentary canal, requires the same treatment, when wounded, as that just recommended in wounds of the intestines.

What mode of treatment would you adopt in wounds of the liver and spleen?

583. "The wounds of the fixed viscera of the abdomen, though highly dangerous, are not necessarily mortal; the simple principle of avoiding or subduing inflammation must guide us in the attempts at relief in these cases."—*Hennen's Military Surgery.*

GENUS 3.—*Vulnus Renum.* Wound of the kidneys.

In wounds of the kidney what treatment is required?

584. "The slightest reflection on the situation and structure of the kidney, and on its various sympathies, will at once show the desperate nature of wounds inflicted on it, even with all the caution of a curative intention."

"The remedies consist of venesection, mild purgatives, as manna, oil, &c.; frequent emollient enemas, the warm bath generally, and local fomentations, so as to excite diaphoresis and moderate urinary secretion, with a diet of the mildest kind, but much restricted in fluids, the indulgence in which, even in small quantity, should be avoided. Stimulants under any form, particularly those which can at all influence the urinary organs, as blisters, diuretics, &c., are decidedly hurtful. The dressings should be extremely light, so as to admit of a free percolation of the urine: the neighbouring parts should be varnished over with some unctuous substance to prevent excoriation, and the bedding should be guarded by an oilskin. By these means (says Dr. Hennen) a few cases that have come to my knowledge have terminated favourably."

GENUS 4.—*Vulnus arteriarum iliacarum.* Wound of the iliac arteries.

If from a wound, or whatever cause, you should be called upon to tie the external iliac artery, in what manner would you perform the operation?

585. "The patient being placed in the recumbent posture on a table of convenient height, the incision is begun just above the abdominal ring, and is extended downwards in a semi-lunar direction to the upper edge of Poupart's ligament, and again upwards to within an inch of the anterior and superior spinous process of the ilium. The incision exposes the tendon of the external oblique muscle: in the same direction the above tendon is to be cut through, and the lower edges of the internal oblique and transversalis abdominis muscles are exposed; the centre of these muscles is to be separated from Poupart's ligament; the opening by which the spermatic cord quits the abdomen is thus exposed, and the finger, passed through this space, is directly applied upon the iliac artery, above the origin of the epigastric and circumflexa ilii arteries. The iliac artery is placed upon the outer side of the vein, and the next step of the operation consists in gently separating the vein from the artery by the extremity of a director or by the end of the finger. The iron-curved aneurismal needle is then passed under the artery, and between it and the vein from without inwards, carrying a ligature, which being brought out at the wound, the needle is withdrawn, and the ligature is then tied around the artery, as in the operation for popliteal aneurism. One end of the ligature being cut away, the other is suspended from the wound, the edges of which are brought together by adhesive plaister, and the wound is treated as any

other containing a ligature."—*Sir A. Cooper's Lectures by Tyrrell.*

Describe the operation for tying the internal iliac artery.

586. The following account of the operation, as performed by Mr. W. Stevens in the island of Santa Cruz, will be found in the fifth volume of the Medico-Chirurgical Transactions:—

"An incision, about five inches in length, was made on the left side in the lower and lateral part of the abdomen, parallel with the epigastric artery, and nearly half an inch on the outer side of it. The skin, the superficial fascia, and the three thin abdominal muscles were successively divided; the peritoneum was separated from its loose connexion with the iliacus internus and psoas muscles; it was then turned almost directly inwards, in a direction from the anterior superior spinous process of the ilium to the division of the common iliac artery. In the cavity which I had now made I felt for the internal iliac, insinuated the point of my finger behind it, and then pressed the artery betwixt my finger and thumb. Dr. Lang now felt the aneurism behind. The pulsation had entirely ceased, and the tumour was disappearing. I examined the vessel in the pelvis. It was healthy, and free from its neighbouring connexions; I then passed a ligature behind the artery, and tied it about half an inch from its origin."

CLASS VIII.—*Pelvica.* Pelvic emergencies.

ORDER 1.—*Parietalia.* Parietal.

GENUS 1.—*Fractura.* Fracture.

May not a fracture of the os innominatum be confounded with dislocation of the thigh-bone, and therefore expose the patient to much pain and hazard in the treatment?

587. Sir A. Cooper says, that "when a fracture of the os innominatum happens through the acetabulum, the head of the thigh-bone is drawn upwards and the trochanter somewhat forwards, so that the leg is shortened, and the knee and foot are turned inwards: such a case, then, may be readily mistaken for dislocation into the ischiatic notch." Again:—"If the os innominatum is disjointed from the sacrum, and the pubes and ischium are broken, the limb is a slight degree shorter than the other; but in this case the knee and foot are not turned inwards."

How would you detect the real nature of the case?

588. "These accidents are generally to be detected by a crepitus being perceived on the motion of the thigh, if the hand be placed upon the crista of the ilium; and they are attended with more motion than occurs in dislocations."—*Ibid.*

What prognosis would you give in this accident?

589. This kind of fracture arises from such violent causes as to be generally attended with the most serious consequences, and hence our prognosis will be unfavourable. Simple fractures of this bone, especially of the ilium, sometimes recover. Sir A. Cooper has seen three cases terminate favourably.—*Ibid.*

What treatment would you adopt in fracture of the pelvic bones?

590. The principal local treatment that can be adopted is, first, to reduce the bones, as far as we can, to their natural situation; and, secondly, to keep them so by a roller applied around the pelvis. The trunk should be steadily kept in one position. The patient should be bled from the system, and locally, if required. The antiphlogistic treatment should be strictly observed, unless there be symptoms of universal debility. Should the bladder be paralyzed the use of the catheter will be necessary.*

GENUS 2.—*Dislocatio.* Dislocation of the bones of the pelvis.

At what points of the pelvis does dislocation usually occur?

591. A dislocation may occur at the sacro-iliac joints, or at the pubic symphisis. "Thus the os sacrum may be driven forwards towards the interior of the pelvis; the ossa ilii may be displaced forwards and upwards; and the bones of the

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* See a very interesting case of a fractured os pubis in the xith vol. of Medico-Chirurgical Transactions, by Mr. Henry Coates, in which he employed, with great advantage, a bandage of wide woollen-girth web instead of a roller. He says, "The immediate object being to support the fractured parts, and it being quite impossible to pass a roller round the patient, I had constructed a bandage of wide woollen-girth web, with buckles and straps placed closely. This was drawn under the pelvis by means of pieces of tape attached to the bandages, which were insinuated by a plate of elastic steel, and then buckled as tight as it could be borne, with directions to tighten it still more, as the bandage should stretch. Two straps from the back part were passed between the thighs, and buckled to the anterior portion of the belt to retain it in its situation. Pads were also placed on each side of the pubis."

pubes may be totally separated at the symphisis."—*Cooper's Dictionary.*

What is the treatment of such dislocations?

592. Our first efforts ought to be directed to the reduction of the displaced bones—a task not easily accomplished; and if this shall be proved impracticable, the pelvis should be steadied, as was recommended in the pelvic fracture. Subsequently our principal attention should be employed in preventing inflammation by bleeding and the antiphlogistic treatment.

ORDER 2.—*Vesicalia.* Vesical.

GENUS 1.—*Retentio urinæ.* Retention of urine.

What are the symptoms of retention of urine?

593. A distressing sense of fulness in the region of the bladder, accompanied with a frequent but ineffectual desire to pass the urine.

How would you know that the bladder was distended with urine?

594. By examining, as every surgeon is bound to do, the lower part of the abdomen; and should I perceive there a large circumscribed tumour rising out of the pelvis, I should immediately conclude that such tumour consisted of the bladder preternaturally distended with urine.

In what manner would you treat a urinary distention of the bladder from whatever cause?

595. Whenever the distention of the bladder is manifest above the pubes, whatever may have been the cause, the catheter should, if possible, be introduced without delay.

State your reason for this practice.

596. To prevent inflammation and gangrene, or rupture of the bladder.

Describe briefly the best mode of introducing the catheter in the male person.

597. The patient should be placed on his back, with his knees moderately bent, and his thighs separated from each other. Having grasped the penis, just behind the glans, with the thumb, index, and middle finger, the catheter, previously oiled, should be introduced, with its concavity towards the left groin, along the urethra as far as the bulb; and during its passage to this point, it will be convenient to draw the penis upon the instrument. As soon as the catheter has reached

the membranous part of the urethra, its handle should be brought in a line with the symphisis of the pubes, and then slowly depressed backwards with a very light hand, till its point has entered the bladder. The operator should remember that its course is very much the segment of a circle; that the more gently it is used, the more easily it will glide into the bladder; and, if it should be resisted in its passage, that it should be withdrawn a little, and never pushed forward to overcome the resistance by force.*

What are the principal causes of retention of urine?

598. Stricture, enlarged prostate gland, paralysis of the nerves of the bladder, foreign bodies in the urethra, laceration of the canal, a displacement of the pelvic viscera, and the gravid uterus.

SPECIES 1.—*Retentio a stricturâ.* Retention from stricture.

How would you treat retention of urine from stricture?

599. "In this case, antiphlogistic means should be adopted without delay. The patient ought to be bled, if nothing in his constitution and age prohibit this evacuation, which it may be even proper to repeat. He should also be put into the warm bath, and fomentations should be continually applied to the hypogastric region. Slightly diuretic beverages may be prescribed, and leeches put on the perinæum. The principal means, however, from which the greatest benefit may be expected, is a liberal dose of the tinctura opii, together with an anodyne glyster."—*Cooper's Dictionary of Practical Surgery.*

Should these means fail, what measures would you next adopt?

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* Where it is necessary to keep the catheter in the bladder, the following method will be found very effectual as well as simple:—Let a common ivory ring, of proper size, be passed around the penis and retained in that situation by three tapes, fastened to a band or handkerchief previously placed around the ilia. Two of the tapes should be carried from the band behind and tied to the inferior part of the ring, one on each side of the scrotum, and the remaining tape from the band in front, and tied to the superior part of the ring. To this ring the upper end of the catheter may be readily and securely fixed. I am aware that Sir Everard Hone has invented an instrument for this purpose, but in country practice few surgeons may possess it. I trust they will find the above method a convenient substitute.

Should the surgeon deem it necessary to wash out the bladder, he will find a most practical instrument for that purpose in a double-tube catheter, invented by Mr. Reed, and which I have seen used with great satisfaction.

600. Mr. Earl has recommended the tobacco glyster, by which he has succeeded in relieving the spasm (Medico-Chirurgical Transactions, vol. vi. p. 88); but I should rather attempt immediately to introduce a small, flexible, gum-catheter through the stricture into the bladder, which object may be frequently accomplished when due care, perseverance, and gentleness are not neglected. And if this should not be practicable, sometimes a fine bougie admits of being passed into the bladder, and on being withdrawn, the urine follows and is discharged.

But should the stricture be impervious by these means, the bladder becoming more and more distended, what would be your next mode of treatment?

601. When all the preceding plans prove unavailing the stricture may be forced with the conical catheter, as recommended by Boyer, Roux, &c.; or an incision practised behind the obstruction, or the bladder punctured.—*Cooper's Dictionary.*

Has any other means been recommended for the dividing of this stricture?

602. Mr. Stafford, surgeon of the Mary-le-bonne Infirmary, has recommended a lancetted stilet for that purpose.

But are not such instruments—as the almost pointed catheter and the lancetted stilet—extremely dangerous in the hands of young surgeons?

603. Assuredly; and in their use, the greatest care should be taken to keep the beak of the instrument in the centre of the course of the urethra, lest a false passage, and an effusion of urine into the cellular membrane, be the result.

Would you not prefer an incision into the urethra, behind the stricture, to the puncture of the bladder?

604. The former is ever to be preferred, when practicable, as the safest practice; and as the great majority of cases of retention arise from stricture in the urethra, this situation for our incision can be generally chosen; besides, this mode of treatment is in close imitation of the natural process for the relief of the patient.

But is not this method more difficult than the puncture of the bladder?

605. Certainly not; every surgeon, who calls himself such, ought to make himself well acquainted with the anatomy, positive and relative, of the urethra and urinary organs, and being possessed of such knowledge, he will find no difficulty whatever in the operation.

To whom are we principally indebted for this improvement in practice?

606. Principally to Sir Astley Cooper, who now seldom or never punctures the bladder. Previously to performing the operation he desires the patient to micturate, by which effort, the urethra is distended with urine immediately behind the stricture, and this distension he judiciously makes the guide for his lancet; "but with respect to the difficulty of the operation," he adds, "I would say to him that finds any, pass a catheter or staff to the stricture, and directed by its point in making the incision, carry it an inch behind, and in a line with the point of such director, and the difficulty will vanish."

Species 2.—*Retentio a glande prostatâ tumidâ.* Retention from an enlargement of the prostate gland.

What would be your treatment of a retention of urine occasioned by a swelling or an enlargemnt of the prostate gland?

607. When the swelling of the gland is of an inflammatory kind, it demands the antiphlogistic treatment, as has been just recommended in the case of stricture; but when it is caused by chronic enlargement, the catheter is immediately and indispensably necessary.

Is there not a difficulty in passing the catheter in this case; and how would you overcome it?

608. It not unfrequently happens that there is a considerable difficulty in passing the catheter in the case of enlarged prostate. In such instances a gum catheter, with a firm stilet, and more than usually curved, should be used; and its passage into the bladder may be facilitated by introducing the index finger of the left hand into the rectum, and pressing the beak towards the pubes.

Should we fail of success in this way, Mr. Hey's method may be tried, which is this:—As soon as the point of the instrument reaches the gland, withdraw the stilet an inch or two, at the same time passing the tube towards the bladder. This method materially increases the curve of the catheter at its lower end, and very often succeeds in its introduction.—*Practical Observations on Surgery.*

Should the catheter fail, what next treatment would you adopt?

609. The bladder ought to be punctured above the pubes.

Species 3.—*Retentio a vesicâ paralyticâ.* Retention from paralysis of the nerves of the bladder.

What treatment would you adopt in a retention of urine caused by a paralysis of the nerves of the bladder?

610. "The local treatment or management of all these affections will consist in relieving the full bladder from time to time by the catheter, until the parts recover themselves, so as to enable the patient to void his urine by the natural efforts."—*Howship on the Diseases of the Urinary Organs.*

But in some instances of retention from this cause, it will be sufficient to make pressure upon the pubic region. See note page 71.

Species 4.—*Retentio a corporibus extraniis in urethrâ.* Retention from the lodgment of a foreign body in the urethra.

How would you treat a case of retention, caused by a calculus or any other foreign body, lodged iu the urethra?

611. In the first place we should endeavour to propel it along the urethra by pressing against it from behind.

Secondly. The urethra should be well injected with oil and dilated by a bougie, wth the view to the calculus being propelled in the same manner, or extracted by ths urethra forceps.

Thirdly. Should its removal by these means be found impracticable, the foreign body, whether a calculus or any other kind, should be removed by an incision externally.—*Cooper's Dictionary of Practical Surgery.*

Species 5.—*Retentio ab injuriâ urethræ.* From injuries of the urethra.

What would be your practice in a retention of urine, caused by a laceration of the urethra, either from external violence or by the unskilful use of instruments?

612. "The treatment consists in introducing an elastic gum catheter into the bladder, with as little delay as possible, and keeping it there until the breach of the canal is repaired."—*Cooper's Surgical Dictionary.*

But suppose that the introduction of the instrument should be impracticable, what other plan would you adopt for the relief of the patient?

613. Should the injury arise from contusion, the bladder be not much distended, and the positive laceration of the canal uncertain, the local application of leeches, followed by a large poultice, may so far reduce the inflammation and swelling, as to allow of the introduction of the catheter upon a subsequent attempt to introduce it. But, on the contrary, should the bladder be distended above the pubes, no time should be lost, and either the urethra should be opened behind the injury, or the bladder punctured.

Should an effusion of urine have taken place into the cellular membrane of the perinæum, how would you dispose of it?

614. By making free incisions into the most depending parts, to allow the urine to escape; and by the employment of fomentations and poultices, with such other antiphlogistic means as may be thought necessary.

Species 6.—*Retentio a dislocatione viscerum pelvicorum.*
Retention from displacement of the pelvic viscera.

What are the displacements of the pelvic viscera, which occasion a retention of urine?

615. Hernia of the bladder—and (in the female) retroversion of the uterus.

Does hernia of the bladder, complicated with retention of urine, at all influence the shape of the bladder?

616. In such a case, the bladder is divided into two cavities or pouches: the one, situated in the hernial sac; the other, betwixt the abdominal constriction and the neck of the bladder.

State the diagnostic marks of vesical hernia.

617. On handling the tumour, a fluctuation is felt, and on making pressure upon it, the patient experiences more or less desire to pass the urine, and occasionally a little urine escapes. —*Cooper's Surgical Dictionary.*

The lower part may be also detected by the finger introduced within the rectum.

What is the treatment of retention from this cause?

618. The patient should be placed on his back, and the catheter introduced into the lower cavity: at the same time pressure should be made upon the upper cavity, so as to press out its contents and reduce the hernia.

Should the hernial constriction be so great, as not to allow of the return of the urine from the upper cavity, what treatment would you adopt?

619. The constriction ought to be relieved by the operation for strangulated hernia.[*]

What is signified by a retroversion of the uterus, and what are its effects upon the bladder?

620. A falling backwards of its fundus towards the hollow of the sacrum, by which the os uteri presses upon the neck of the bladder, and occasions a retention of urine.

At what period of utero gestation does retroversion usually occur?

621. During the third, fourth, and even fifth month of pregnancy.

In what manner does retroversion take place?

622. The primary cause may be either with the uterus or the bladder. The former may cause it by prolapsus; the latter by over-distention.

Does retroversion occur to the uterus under any other circumstance except that of pregnancy?

623. "It may also be produced when the womb is enlarged to a certain degree by disease."[†]—*Burns' Principles of Midwifery.*

What are the diagnostic symptoms of retention of urine from retroversion of the uterus?

624. The period of pregnancy above-mentioned; a difficulty to pass the stools as well as the urine; bearing down pains; and, on examining the patient per vaginam, we shall find the fundus of the womb, forming a tumour towards the posterior part of the vagina.

What is the treatment of this case?

625. The urine should be immediately drawn off by the catheter, and the operation repeated twice daily, till the womb returns to its natural position.

Is there not sometimes a difficulty in passing a catheter into the bladder in these cases?

626. Yes—and it is occasioned by the pressure of the mouth

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[*] After having liberated the stricture, should it be found that the communication between the cavities were obliterated by adhesive inflammation, Desault advises that the cyst should be laid open, and, if necessary, removed.

[†] Whilst this Work was in the press, Mr. Fowler of Southampton consulted me in a case of this kind. The lady was ætat. about 40. The retroversion was complete, and adherent to the left side of the vagina. It was caused by the pressure of an immense scirrhous tumour. Dropsy of the belly supervened, and death.

of the impregnated or enlarged uterus against the urethra or neck of the bladder.

What kind of female catheter would you use, and in what position would you introduce it?

627. We should use either a gum-elastic or a flat silver catheter; and it should be introduced with its concavity towards the sacrum, to correspond with the course of the neck of the bladder.

Suppose you should not possess either a flat-silver or a gum-elastic catheter, how would you facilitate the introduction of the common silver one?

628. "If it do not pass easily, we may derive advantage from introducing the finger into the vagina, and endeavouring to depress the os uteri, or press back the vaginal tumour."—*Burn's Principles of Midwifery.*

If the catheter could not be introduced, would you puncture the bladder?

629. "If the catheter cannot be introduced, we have been advised to tap the bladder; but this, fortunately, is never requisite. I cannot conceive any case, where a gum-catheter could not be introduced. I certainly have never, as yet, met with such a difficulty."*—*Ibid.*

For the treatment with regard to the uterus, see Retroversio uteri, 674.

Species 7.—*Retentio a compressione uteri gravidi.* Retention from pressure of the gravid uterus.

Is retention of urine occasioned by the gravid uterus a frequent occurrence?

630. It not unfrequently happens during protracted and laborious parturition.

Might not this kind of retention be generally prevented?

631. A prudent practitioner will, during every protracted labour that he attends, put himself in possession of the actual state of the bladder, both by inspecting the quantity

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* Mr. Howship mentions prolapsus of the bladder amongst the causes of retention, and describes a case, which occurred to his own practice, to illustrate the fact. A case of prolapse of the bladder fell under my own observation. It answered, in its appearance, precisely to the description given by Mr. Howship, but without producing any retention of urine. The lady was about fifty years of age, and sought in vain for a remedy to alleviate her complaint, which became a source of protracted suffering and inconvenience.

of urine evacuated, and by examining the pubic region, that he may, if necessary, use the catheter and thus prevent the danger of a retention.*

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* From the want of this precaution, a young practitioner, in a long and tedious labour, may be suddenly overtaken by the bursting of the bladder, and the patient lose her life; as happened in the following case.

A woman, thirty-five years of age, suffered a protracted labour with her first child from a rigidity of the os uteri, an unyielding state of the vagina, and a somewhat small pelvis. After the expiration of about thirty-six hours, the head passed through the mouth of the womb; and as it was gradually making its way through the vagina, with the occiput in the range of the pubes, the poor woman felt something suddenly give way in the belly. She was instantly seized with severe pain and heat over the abdomen, an inability to lie down in the horizontal position, and an incessant vomiting. This state of things naturally created the greatest alarm in the minds of the attendants and friends, and her accoucheur was immediately sent for. On his arrival, he found her in the anxious and distressing state above-mentioned, and constantly vomiting matter of the colour and consistence of coffee-grounds. The first impression on his mind was, that the uterus was ruptured; but this was in great measure disproved by the head of the child not having receded, and by there not being any vaginal discharge. As the labour-pains had wholly ceased from the moment the sensation was first felt, he immediately proceeded to extract the child by means of the forceps, which was done with great facility; the placenta was thrown off naturally a short time afterwards. Notwithstanding the accomplishment of her delivery, she was in no degree relieved of the pain of the abdomen, the distressing vomiting of the dark-coloured matter, and the inability to lie down. In addition to these symptoms, she soon became affected with difficult respiration, tenderness and tension of the abdomen, and symptomatic fever, under which she gradually sunk in a few days. On examining the body, the peritoneal cavity of the abdomen was found to contain about two quarts of urine, which had made its escape from the fundus of the bladder through an ulcerated perforation the size of a goose-quill.

These unfortunate cases are in the highest degree interesting and instructive to all practitioners in the obstetric art, and more especially to those just entering into that branch of their profession. They warn them to examine, from time to time, the pubic region, lest a retention of urine may have taken place, and lest, in an unexpected moment, the bladder should burst, and the situation of the patient become instantly hopeless. In this species of retention, circumspection is more necessary than in any other, because in the latter, the patient is aware of the existing evil by his own sensations; whilst in the former, the condition of the bladder is concealed by uterine suffering. It is true that the urinary receptacle is capable of great distention before it gives way; but this in nowise justifies a want of vigilance on the part of the accoucheur.

Two cases of this kind will be found in Doctor Ramsbotham's Practical Observations in Midwifery.

Mr. Hey also states one in the fourth volume of Medical Observations and Inquiries; and I believe another is recorded by Chapman.

How would you detect a retention during labour?

632. By there being a tumour at the pubic region, corresponding with the shape and size of the bladder in a state of distention, and which can be most readily distinguished from the uterus behind it.

Do you not approve of the catheter being introduced occasionally during a protracted labour, whether such a proof be present or not?

633. It is the safest practice, and it ought to be adopted.

PUNCTURE OF THE BLADDER.

If in the male subject it should be found impracticable, from the particular cause of the retention, to evacuate the bladder by the urethra, what remains to be done?

634. To puncture the bladder.

At what parts may the bladder be punctured without wounding the peritoneal covering?

635. Anteriorly and inferiorly above the pubes.
Posteriorly and inferiorly through the rectum.
Inferiorly and laterally on the outside of the prostate gland.

Describe the situation of the peritoneum with reference to the bladder.

636. The peritoneal covering "passes from the abdominal parietes above the pubes to the fundus of the bladder; and is continued to the back of the bladder, near the prostate gland, and is then reflected to the fore part of the rectum. Thus the cervix of the bladder, and its fore part above and behind the pubes, also the posterior and inferior part behind the prostate gland as far as the entrance of the ureter, are devoid of peritoneal covering."—*Sir Astley Cooper's Lectures by Tyrrell.*

Is the puncture above the pubes an operation of easy performance?

637. "When the bladder becomes excessively distended, its fundus rises towards the umbilicus, and carries with it the peritoneum, so that a considerable space is left above the pubes, uncovered by this membrane, at which place a trocar may be easily introduced without danger of wounding it. This space is covered by the linea alba in the centre, and at the sides by the pyramidales and recti muscles, the bladder being attached beneath by cellular tissue."—*Ibid.*

Describe the mode of performing the puncture at this point.

638. " 1st. The patient is to be placed on a table, in the horizontal position, with his knees a little elevated.

2dly. The hair is to be removed from the pubes.

3dly. An incision, one inch in length, is to be made through the integuments immediately above the pubes in the direction of the linea alba.

4thly. A trocar and canula of sufficient length are passed through the opening in the skin, and then thrust through the linea alba, cellular tissue, and forepart of the bladder, into its cavity.

5thly. The direction of the trocar should be to the basis of the sacrum; that is, a little upwards, and not directly downwards, in a perpendicular line; as it may then pass between the bladder and the pubes: and even if the instrument enters the bladder, as the organ contracts, it slips from the canula.

6thly. The trocar is to be withdrawn, to allow the urine to escape through the canula.

7thly. A male flexible catheter is to be passed through the canula, cut to a proper length, so as to remain in the bladder, and it is to be secured, so as to prevent its escape."—*Ibid.*

Describe anatomically that part of the bladder which is to be perforated through the rectum.

639. " Behind the prostate gland is a triangular space bounded in the following manner—on each side by the vasa deferentia and vesiculæ seminales, meeting at the prostate; and the peritoneum is the boundary behind. In the centre of this space a trocar and canula may be passed through the forepart of the rectum, through the cellular tissue connecting it to the bladder, and through the coats of the latter into its cavity."—*Ibid.*

Is there no danger of wounding important parts in the performance of this operation?

640. " If the centre of the space be kept, there is no danger of wounding the vasa deferentia or vesiculæ seminales, if the bladder be distended. The trocar may be safely introduced an inch behind the prostate, without risk of injuring the peritoneum, and the vasa deferentia may be thus completely avoided, whereas a puncture near the gland might endanger them."—*Ibid.*

Describe the mode of performing the puncture through the rectum.

641. " 1st. The patient is to be placed on a high table, so that the surgeon can sit lower than the patient.

2dly. The finger is to be passed per rectum to the projecting portion of the bladder behind the prostate.

3dly. A trocar and canula, three inches long, are to be passed upon the finger to the protruding part of the bladder, and forced through the forepart of the rectum and posterior part of the bladder into its cavity. A curved trocar has been advised and employed; but it is quite unnecessary, if the silver canula be not suffered to remain.

4thly. The trocar is to be withdrawn, and a flexible gum-catheter is to be passed through the canula into the bladder; the canula is then to be removed, and the elastic catheter is to be confined to a T bandage, or to a tape passed between the thighs."—*Ibid.*

Describe the lateral point at the inferior part of the bladder, where you purpose to puncture it.

642. "The neck of the bladder around the prostate gland is devoid of peritoneum; and, excepting the posterior surface, where the vasa deferentia and vesiculæ seminales are seated, there is no important part at this point, which can be injured by a puncture."—*Ibid.*

But is not this a more difficult operation than the above?

643. This operation requires more anatomical knowledge than the two, which I have described; it is more difficult to perform, and much more care is required to preserve the opening into the bladder; yet to a scientific surgeon even this presents but little difficulty."—*Ibid.*

What are the steps of this operation?

644. "1st. An incision is to be made in perinæo, as in the operation for the stone, and it is to be carried to the bulb of the urethra, where it is covered by the accelerator urinæ.

2dly. The bulb is to be pressed by the finger to the patient's right side, and the incision is then carried onwards between the bulb and left crus of the penis, as far as the prostate gland.

3dly. The surgeon is to pass his finger into the wound as far as the left side of the prostate gland, so that it may serve as a guide to the canula and trocar.

4thly. The trocar and canula are to be pushed into the cavity of the bladder by the left side of the gland.

5thly. The trocar being withdrawn, the canula is left in the bladder, to allow of the escape of the urine.

6thly. Through the canula an elastic gum-catheter is to be passed and secured, as in the former case."—*Ibid.*

Of the three operations just mentioned, which would you select as the most advantageous to the patient?

645. This will very much depend on the existing circumstances of the case. Should the prostate gland be so enlarged as to encroach considerably upon or occupy the triangular space above described; or should the rectum be diseased, the pubic space should be chosen for the puncture: but should there exist no such objections, one of the posterior operations should be performed; and, as that through the perineum is not altogether safe from the hands of every practitioner, I should say that the puncture through the rectum ought generally to be preferred.

The puncture of the bladder is rarely required in the female; but should it become necessary, at what part of the bladder would you make the puncture?

646. " The operation above the pubes appears to be in all respects preferable to any other."—*Sir Astley Cooper's Lectures by Tyrrell.*

Why not puncture the inferior and posterior part of the bladder?

647. Because it would probably occasion a fistulous orifice, that would constantly irritate the vaginal passage, and thus ever destroy the comfort and happiness of the individual.

If it should unfortunately happen that the bladder shall have burst into the cavity of the belly before your arrival, have you any mode of treatment to propose, that holds out even a chance of saving the patient's life?

648. In such an emergency the peritoneal cavity should be treated as the stomach, under the influence of a poisonous fluid.*

1st. Let the patient be placed in the recumbent position, lying a little on the left side.

2dly. An incision should be cautiously made, midway between the navel and the anterior and superior process of the ilium, through the parietes of the left side of the abdomen. It should be an inch long, and longitudinal with reference to the belly.

3dly. The long tube of the stomach-pump (being previously oiled) is to be cautiously introduced through the opening, and gently carried down to the cavity of the pelvis.

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* The quantity of urine, which the human bladder can contain without inconvenience, is about one pint and half; but it is difficult to state the quantity, that can be retained without bursting the organ. Mr. Clark of Farnham drew off seven pints from a female in a case of retention.

4thly. The urine may now be evacuated by the action of the piston—and subsequently well washed out with warm water, which should be also carefully evacuated.

5thly. The wound being closed with sticking-plaister, compress and roller, a flexible gum-catheter should be kept in the bladder, and inflammation combated with general and topical bleeding, and by such means as are recommended for the cure of peritonitis.*

ORDER III.—*Puerpero-uterina.* Puerperal-uterine.

GENUS 1.—*Abortio.* Abortion.

What is the principal circumstance, connected with abortion, that requires our immediate attention?

649. Profuse hemorrhage.

What is the distinction between abortion and premature labour with reference to time?

650. Abortion, according to Dr. Denman, has reference to the six first, and premature labour to the three last months of utero-gestation.

Is the danger from hemorrhage the same throughout the whole period, in which abortion may occur?

651. The farther a patient is advanced in her pregnancy, the greater the danger, and vice versâ.

Could any mode of treatment be adopted, that would probably prevent abortion at the onset of the symptoms?

652. It is probable that a far greater proportion of abortions would be prevented, were proper remedies adopted as soon as the incipient symptoms occurred.

What treatment would you adopt with a view to prevent abortion

653. This must depend on the constitution of the patient. Mr. Burns says, " When, in a plethoric habit, abortion is

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* I am not aware that this mode of treating effusion of urine into the peritoneal cavity of the abdomen has ever been adopted; but from the hopeless state of the patient, when left without any attempt to evacuate the urine, we should be certainly justified in performing the operation.

Since writing the above, I find, upon referring to his Lectures, that Dr. Blundell has advised the same mode of treatment; and moreover recommends that the bladder be drawn up to the opening in the abdomen, and that the rent be closed by ligature.—Lancet, 1828—29. vol. i. p. 516.

Although this last step has been successfully tried by him in rabbits, I very much doubt its practicability in the human subject.

threatened from a fright or mental agitation, we have often palpitation, rapidity of the pulse, headache, flushed face, and pain about the back or pubes. Blood-letting relieves immediately the uneasiness in the head, and often the pain in the back; afterwards the patient is to be kept cool and quiet, and an anodyne administered."—*Principles of Midwifery.*

In habits, however, that are not plethoric, blood-letting ought to be omitted, and we must content ourselves with confining the patient to the horizontal position, with quietude both of body and mind, with prescribing an anodyne, and with a cooling plan of treatment.

If uterine discharge shall have taken place, is there a probability of preventing the miscarriage?

654. The probability is certainly less: but should there be no uterine pains accompanying the discharge, and the fœtus be active, the expulsion may be frequently prevented by absolute rest, and the adoption of either of the above modes of treatment, according to the state of the patient.

Do you consider general blood-letting admissible as a remedy for the checking of uretine hemorrhage in abortion?

655. "Many practitioners, upon a general principle, bleed, in order to check this and prevent miscarriage; but miscarriage cannot be prevented if the uterine contraction have universally commenced; and the discharge cannot be prudently moderated by venesection, unless there be undue or strong action in the vessels, or much blood in the system; and if so, a vein may be opened with advantage."—*Burns' Principles of Midwifery.*

What are the means you would employ to restrain profuse hemorrhage, when the process of abortion is going on?

656. "The application of cloths dipped in cold water to the back and external parts, ought always to be had recourse to. If the digitalis have been exhibited, it assists that medicine in moderating the circulation.* Even when trusted to alone, it lessens the action of the sanguiferous system, particularly of the uterine vessels. The introduction of a small piece of smooth ice into the vagina has been recommended, and has often a very speedy effect in retarding the hemorrhage, whilst it never, if properly managed, does any harm. A small snow-ball, wrapped in linen, will have the same effect: but neither of these must be continued so long as to produce pain, or much or prolonged shivering. The heat of the surface is also to be

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* I have found the liquor ammoniæ acetatis very useful in hemorrhagic abortion. I prescribe it in the dose of ʒss. every four hours.

moderated by having few bed-clothes and a free circulation.—But the most effectual local method of stopping the hemorrhage is by plugging the vagina."*—*Ibid.*

How would you plug the vagina?

657. "This is best done by taking a pretty large piece of soft cloth, and dipping it in oil, and then wringing it gently. It is to be introduced with the finger, portion after portion, until the lower part of the vagina be well filled. The remainder is then to be pressed firmly on the orifice."—*Ibid.*

Upon what principle does the plug act in restraining hemorrhage?

658. "This acts by giving the effused blood time to coagulate."—*Ibid.*

Do you consider fainting as favourable or unfavourable to the patient under circumstances of abortion?

659. It may be considered a favourable occurrence, when it is produced by *moderate* hemorrhage, and then ought not to be interfered with; but when it is the result of profuse hemorrhage, and is accompanied with scarcely a perceptible pulse, and great restlessness, it is indicative of great danger, especially if the gestation be considerably advanced and the hemorrhage continue.

If the means above recommended, or syncope, should fail to arrest the hemorrhage, what further means would you adopt?

660. I should consider it incumbent on me to extract the ovum, using the greatest possible caution in the operation.†

Is it often necessary to remove the ovum before the twelfth week of utero-gestation?

661. Although the loss of blood before this period is frequently enormous as to quantity, it is notorious that early abortions generally do well without any manual interference.‡

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* This practice chiefly obtains in Scotland, and I remember to have heard one of the principal accoucheurs of Edinburgh speak very highly of the practice. I do not believe that it is held in equal estimation in London, where it is seldom used. For myself, I should say that, where the plug is necessary, it is equally necessary to extract the ovum.

† This is an operation which I have been often called upon to perform, and which I have never had occasion to regret; as I have ever found the extraction of the ovum followed by a cessation of the bleeding

‡ Let not the young practitioner be lulled by this observation into too great a security, and leave his patient hastily, whilst she is losing large quantities of blood, even at the period of *ten* weeks. Let him rather not

Are there any other means, that could be justifiably used to accelerate the expulsion of the ovum and check the flooding before you may deem it necessary to extract the ovum?

662. The membranes, if they should be whole, may be broken; or "a warm saline glyster may be given of such strength as shall briskly stimulate the rectum, and excite sympathetically the uterus."*—*Burns' Principles of Midwifery.*

Doctor Blundell, in his Lectures on this subject, advises the use of the ergot of rye, which, he says, he has tried with the greatest advantage.—*Lancet.*

In our present experience of the ergot, would you suffer it to take precedence of the extraction of the ovum in cases of great danger from hemorrhage?

663. Decidedly not; as the life of the patient may be lost whilst we are waiting for its effects—effects, although in some cases very powerful, in others altogether ineffectual.

State the cases of abortion, in which you would feel justified in administering the ergot.

664. 1st. As a general rule, the ergot may be given to expel the ovum in all cases of profuse hemorrhage, before the tenth week of gestation.

2dly. In those cases of abortion, where great difficulty is found in extracting the ovum.

3dly. In cases, where flooding continues from a portion of the placenta being left in the uterus, and which cannot be extracted with safety to the patient.

State your reason for advising the ergot before the tenth week of utero-gestation.

665. Because before this period the difficulty of extraction is greater and the danger of hemorrhage less; but, as has been stated, in a case where the life of the patient is in imminent danger from profuse hemorrhage, it ought *never* to take precedence of our endeavouring to extract the ovum by the prompter method of manual operation.

What is the specific property of the ergot, and what dose would you administer in cases of abortion?

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hesitate to examine her per vaginam, to ascertain the state of the uterus, and the real quantity of the blood flowing from her, that he may act accordingly. A contrary practice has, I am convinced, sometimes been attended with the most fatal results.

* With this view would not a terebinthimate glyster answer the same purpose, and in a more effectual and speedy manner?

666. The ergot of rye is supposed, and with great reason, to possess a specific power to cause a contraction of the muscular powers of the uterus. "It is given in the dose of a scruple of the powder every quarter of an hour," as recommended by Dr. Dewees, who says that it is seldom necessary to give more than three doses.

Is not the abstracting of the ovum attended with danger to the patient?

667. In so delicate an operation the greatest self-possession, caution, and gentleness is absolutely necessary; without which, it may be fraught with serious consequences.

Suppose you should find the woman in a state of decided syncope, the hemorrhage being thereby suspended, would you proceed immediately to extract the ovum or wait till you have in some degree recovered her?

668. "I should wait till the woman rallies or has recovered from the syncope, and then, *upon the return of the bleeding*, I should proceed to operate."—*Doctor Blundell's Lectures. Lancet.*

State the mode of performing the operation.

669. The woman is to be laid on her left side, as in delivery. Then, the hand being smeared with some simple unguent and introduced into the vagina, one or more fingers, according to the degree of dilatation of the uterus, is to be carried slowly and with a semi-rotatory motion into its cavity, and the ovum cautiously separated, taking care that the whole be detached before we begin to extract. In some instances, where the ovum is in great measure detached, and hanging out of the os uteri, the object is soon effected; whilst, in others, the difficulty may be much increased by the uterus being irregularly contracted into what is termed the hour-glass form. In the latter case we must not be dismayed, but cautiously and gently dilating the contraction, in the manner directed for the dilation of the mouth of the womb, the fore-finger is to make its way into the fundus of the uterus, and the incarcerated portion of the placenta detached. This part of the operation may be rendered more easy by causing the uterus to be pressed downward from the abdomen, so as to keep it steadily within our reach.

Is it usual to meet with profuse hemorrhage after the expulsion or extraction of the entire ovum?

670. Hemorrhage, after the evacuation of the uterus, is by no means a common occurrence in abortions.

If dangerous hemorrhage should occur at this period, what means ought to be used to restrain it?

671. The application of cold wet cloths to the loins, pubic region, and external parts of generation, and the internal adhibition of the spiritus ammoniæ aromaticus in cold libations of milk and gruel.

Should this plan not succeed in contracting the uterus and checking the flow of blood, are there any other more potent remedies, which might be adopted?

672. Ice or snow, if at hand, may be substituted for the cold wet cloths, and carried into the vagina; and great benefit will be found by giving immediately a full dose of laudanum—sixty minims—which may be repeated, if the symptoms of exhaustion continue in an alarming degree. In such a state of things the patient should not be raised from the horizontal position, and the head ought to be kept low.

Are there any other symptoms consequent upon abortion that are sudden and dangerous, and require immediate attention?

673. "Sometimes, instead of a feeling of sinking and faintness, the fibres of the stomach are thrown into a spasmodic contraction, producing sudden and violent pain. This is a most alarming symptom, and may kill the patient very unexpectedly. It is to be instantly attacked by a mixture of sulphuric æther and tincture of opium in a full dose, whilst a sinapism is applied to the epigastric region; but if, when this pain occurs, there be symptoms of approaching convulsions, then bleeding should precede the anodyne, and no æther should be given."—*Burns' Principles of Midwifery.*

GENUS 2.—*Retroversio uteri.* Retroversion of the uterus.

You have provided for the treatment of the bladder [See Order Vesicalia, Gen. Retentio a Dislocatione Uteri, 620] *in retroversion of the uterus, when speaking on the causes of retention of urine; but in this place I would ask you, what treatment you would adopt with regard to the uterus after having emptied the bladder by the catheter?*

674. Denman says, that "if the uterus, when retroverted, can be replaced by art without the exertion of much force or the risk of mischief, the immediate reposition, though not absolutely necessary, is at all times an event to be wished; as farther apprehension and trouble are prevented, the safety of the patient secured, and her mind quieted; but when the uterus cannot be replaced without violence, it seems more

justifiable to wait for its return, and to satisfy ourselves with watching and relieving the inconveniences produced by the retroversion."—*Denman's Midwifery.*

In what manner would you perform the operation of replacing the uterus to its natural position?

675. The hand being introduced into the vagina, the uterine tumour is to be pressed up slowly, firmly, and steadily: and this may sometimes be assisted by elevating the breech of the woman. Forcible and violent attempts are, however, to be strongly reprobated; they give great pain, and may even excite abortion, inflammation or convulsions."—*Burns' Principles of Midwifery.*

Suppose that such an attempt were not to succeed, would you fear that the uterus would not ultimately be restored to its natural position?

676. There would be no grounds for such apprehension; for Denman remarks that "the longer the attempt to replace the uterus is delayed, the more easy the operation will ultimately be, and the success more certain."—*Denman's Midwifery.*

GENUS 3.—*Antiversio uteri.* Antiversion of the uterus.

What is signified by an antiversion of the uterus?

677. An antiversion is signified, when the fundus is thrown forward so as to compress the neck of the bladder, and the mouth of the uterus is turned to the sacrum.

What is the treatment of antiversion?

678. "The urine should be evacuated and the fundus raised up."—*Burns.* After which, the recurrence of the displacement should be prevented by compress and roller carried round the lower part of the abdomen, and by the observance of the horizontal posture.

GENUS 4.—*Parodynia.* Morbid labour.

State the grand causes of morbid parturition.

679. Resistance and a want of power.

What are the principal causes of resistance?

680. 1. An excess of the liquor amnii.
2. Rigidity of the os uteri.
3. An unyielding state of the membranes.
4. Rigidity of the vagina.
5. Disproportion between the cavity of the pelvis and the head of the child.

6. Obstructions in the passage—such as tumours, stone in bladder, or retention of urine.
7. Adhesions and cicatrices of the vagina.
8. Shortness of the umbilical cord.
9. Malposition of the uterus.
10. Malposition of the child.

Species 1.—*Partus impeditus.* Impeded labour.

Var. 1.—*A redundantia liquoris amnii.* From excessive quantity of the liquor amnii.

What are the circumstances, that would lead you to suspect the uterus to be over-distended by the liquor amnii?

681. The long continuation of pains without a corresponding dilatation of the mouth of the womb.

How would you distinguish this case from that of very tedious dilatation from rigidity of the os uteri?

682. In the former we shall find by examination, *during the pains*, that the os uteri is not at all acted upon by the longitudinal fibres; whilst in the latter, it will be found more or less upon the stretch. It is true, that in the former, the mouth of the womb may be a little dilated, and that, in the latter, the progress may be so slow, as to be scarcely perceptible or discoverable from pain to pain; still in the tedious case, from rigidity, we shall be generally enabled, by comparison, to mark a progress, however slow; but in this from over distention, no progress will be made, although the pains continue to harass and wear the patient.

What is the treatment of this case?

683. The membranes ought to be ruptured, as soon as we are convinced by waiting a reasonable time, and watching the character of the case, that the labour is interrupted by this cause.

You mention a reasonable time—what length of time do you mean by this expression?

684. As a practical rule—if no progress in the dilatation take place in twelve hours, the pains having continued during that time, the membranes may be ruptured.

Do you mean to be understood, that you recommend this practice when the os uteri is scarcely at all dilated?

685. Certainly not; the os uteri ought to be found dilated to

about the size of half-a-crown piece, to prove that nature had made an attempt at labour; otherwise, an uncalled-for operation may be performed and premature labour brought on.*

Is this practice attended with hazard to the patient?

686. With none whatever; provided the case be of the kind here described, and the operation be performed with care and tenderness. It is true that Denman objects to any interference in this case. He says, "That this slow or feeble action from distention, is not, therefore, an object of art; and it is, perhaps, beyond the influence of any earthly power to give to the uterus its native or genuine disposition to act, before it is disposed to assume it; to add to its power; or in any material degree to increase its energy, though many applications and medicines have been recommended and tried for this purpose. Human art may put or preserve the constitution in a state best fitted for such action, or *it may remove any impediments to its effects;* but the principle is wholly independent of the will of the patient or the skill of the practitioner."—*Denman's Midwifery.*

Doctor Denman, in this passage, appears to be inconsistent, by first objecting to any interference, on the ground that we have no power over the native principles of uterine action, and then admitting, that it may be in the power of art "to remove any impediments"—to that action. Here we have nothing to do with the principle, but with the impediment; and as the excess of fluid is the impediment in this case, it ought to be removed by the treatment above recommended; and, in my opinion, this treatment is amply justified and recommended by the two cases just quoted.

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* The two following cases may serve to illustrate this point. A gentleman had been in attendance on a poor woman in labour with her second child forty-eight hours; but no apparent progress having been made, he became uneasy, and sent for a second opinion. On my arrival, I found that the pains, which had been pretty constant, had done very little in dilating the os uteri, which was about the size of half-a-crown piece. Suspecting the cause, I asked the woman, if her first labour had been completed without the interference of her former accoucheur? She replied, that she believed her waters were broken, before the labour could be effectually brought on. This induced me immediately to rupture the membranes; shortly afterwards the labour proceeded, and she was delivered in the course of four hours.

A woman, ætat. about 20, having been in supposed labour during two days with her first child, without any material progress taking place, the midwife who attended her, sent for me. On my arrival, I found the mouth of the uterus about the size of half-a-crown piece, with its edges thin, but not at all acted upon by the pains, which had been very frequent, had considerably worn the patient, and caused her to despair of being delivered. I immediately decided on breaking the membranes; but as the mouth of the womb lay high up in the vagina, and as the membranes were strong, I had a good deal of difficulty in rupturing them. This, however, I at length accomplished; and, to my disappointment, only a very few ounces of water escaped; but, on my again introducing my hand, and pressing up the head, a large gush of water took place, and explained the true nature of the case. Immediately afterwards the pains increased, the dilatation went on rapidly, and the delivery was complete in a very few hours.

Burns, to whom the profession will ever be indebted for one of the most practical Works on midwifery, says on the subject, "If, again, in lingering labour, the membranes be entire, the os uteri soft, lax, and considerably dilated, and the presensation natural, it is allowable and beneficial to rupture the membranes; and this is more especially proper if the uterus be unusally distended."—*Principles of Midwifery.*

Might not the waters impede the dilatation of the os uteri after that the membranes have been ruptured?

687. Yes; a considerable quantity, nay, the bulk of the water may be kept back by the pressure of the head; and in that case, the pains will have no farther effect than that of expelling a small portion of the fluid at every effort, till the whole has dribbled away; and thus the progress of the labour will be frequently retarded for several hours.

How would you accelerate the labour under this circumstance?

688. By pressing up the head of the child with the fingers, till the whole of the water has escaped, and by administering a saline glyster.

VAR. 2.—*A rigiditate oris uteri.* From rigidity of the os uteri.

In what cases do you expect to meet with tedious labour from a rigidity of the os uteri?

689. 1. In labours with first children, especially if the woman be advanced in age.

2. In cases, where the os uteri is under the influence of scirrhous disease.

Should you feel justified, in tedious labours from this cause, to use any means, general or local, to hasten the dilatation?

690. As a general rule, no such means ought to be used in this stage of labour, for, in the great majority of cases, the dilatation will be (as it most assuredly should be) slowly and safely performed by the natural powers. But there are exceptions to this rule, which will justify our interference and require our assistance.

State such exceptions.

691. I mean such cases, where the dilatation is deferred beyond a reasonable time, and where the ultimate safety of the patient is thereby endangered. "It is an undeniable proposition that there is, in every case, a period, beyond which it cannot be protracted without exhaustion; and it is no less certain, that if we wish to avoid this exhaustion, which may be followed by pernicious effects, we have only the choice of either suspending the action altogether for a time, or of endeavouring to render it more efficient, and of effecting the desired object within a safe period."—*Burns' Principles of Midwifery.*

Do you think an inexperienced practitioner, however well instructed, is capable of legislating upon this point without additional consultation?

692. Every young practitioner, should he meet with a case of this kind, ought to call in some experienced friend to guide his conduct, until he shall have sufficiently matured his judgment in the field of practice; as it is experience only, that can improve our judgment and enable us to act in these anxious moments with safety to others and satisfaction to ourselves.

In cases of tedious dilatation from rigidity, how long would you wait for the effect of natural labour, before you would have recourse to the assistance of art?

693. "If the pain be continuing, without suspension, for an interval of some hours, and the labour be going on all the time but slowly, it is a good general rule to effect the dilatation of the os uteri within ten or twelve hours, at the furthest, from the commencement of regular labour."—*Burns' Principles.*

In what manner ought this to be accomplished?

694. "It is best done by pressing on the anterior edge of the os uteri, during a pain, with two fingers, with such moderate force as shall not give additional pain, and shall appear to excite the natural dilatation as much as to produce mechanical opening. By doing this for several pains in succession, or occasionally during a pain, at intervals, according to the effect produced and the disposition to yield, we shall soon have the os uteri completely dilated."

"The operation will be best effected in this manner—"if the os uteri be flat and opposed to the head. If it be somewhat projecting, it is aided by introducing two fingers, and extending them laterally with gentleness during a pain."—*Ibid.*

Is the propriety of this practice sanctioned by the experience of others who are authorized to legislate upon so important a subject?

695. Mr. Burns says, "Of the benefit and perfect safety of this practice I can speak positively, and am happy to strengthen my position by the authority of Doctor Hamilton, who makes it a rule to have the first stage of labour finished within a given time."—*Ibid.*

Doctor Hamilton says, "If at the end of twelve hours from the actual commencement of labour, the os uteri be not completely dilated, measures are to be forthwith adopted to secure that object as quickly as possible; because the protraction of the first stage beyond twelve or fourteen hours is productive of many untoward circumstances, such as exhaustion, morbid determination of the blood to various parts, and debility of the uterus, with all its consequences."—*Outlines of Midwifery.*

Under what circumstances of the os uteri can the operation be done with safety to the patient?

696. "Two circumstances are necessary to render it safe; the os uteri must be lax and dilatable; and the dilatation must be gradually and gently effected during the continuance of a natural pain."*—*Burns' Principles.*

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* Although Mr. Burns asserts that "this advice is not meant to sanction rash and unnecessary attempts to dilate the os uteri," I cannot but consider that the rule laid down, requires to be in no small degree qualified for the incipient practitioner.

Denman says, "That by far the greater number of those labours, that have been considered as difficult, and which really were such at the conclusion, were not, in fact, occasioned by the absolute state of the patient, but by the interposition and the desire to accelerate labours, which, in their nature, required a certain time for their completion. This interposition has chiefly consisted of two points of practice, both extremely reprehensible; the artificial dilatation of the os uteri, and the premature rupture of the membranes. By such practice, the order of the labour becomes disarranged; and there often follow occasions to exercise art for the relief of those evils, which were originally caused by the improper use of art to the great hazard of the parent or child. So long, therefore, as labours proceed naturally, that is, with pains efficient, and returning regularly, they may be proper objects for our observation, reason, and judgment, but cannot be considered as objects of art."—*Denman's Practice of Midwifery.*

Doctor Osborne observes, "Every attempt, upon slight occasions, to interrupt this deliberate and protracted course, evidently designed by nature to answer the wisest and best purposes, must be founded on wrong principles, nay, and often will be productive of present and future injury to the patient."—*Essays on the Practice of Midwifery.*

Doctor Ramsbotham has the following passage: "Whatever time may have passed since the commencement of the labour—whatever may have

Have you any other means to recommend in this case to expedite the labour beside that of artificial dilatation?

697. Should the rigidity be extreme, the os uteri heated, painful on examination, and highly sensible of the labour pains, it will be right to take blood from the arm, and

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been the previous sufferings of the patient—or whatever may seem to be her present sufferings—we must carefully abstain from any officious interference; it only adds to the distress of the patient. Any attempts, therefore, to hasten labour, by forcing the pains, by irritating the os uteri, &c., are equally reprehensible and injurious."—*Practical Observations in Midwifery.*

Doctor Blundell, in his Lecture on lingering labour, says, "That in lingering labours, unless there are symptoms of danger, the less you interfere the better; for a meddlesome midwifery is bad."

These are the opinions of very able men, who are decidedly opposed to the practice of Doctor Hamilton and Mr. Burns. In my earlier practice, I was very much influenced by the principles of the former, till I met with a case, which made me, under certain circumstances, a convert to the practice of the latter.

Being engaged to attend a lady, living at some distance, in her first confinement, I was sent for, at the onset of her labour, early on Monday morning. The pains were regular, acting, though very slowly, upon the os uteri; but, towards evening, as little progress had been made in dilatation, and as I had some important cases to attend to, nearer home, I left her; promising to return as soon as possible. I returned; and, lying down in a room adjacent, I heard the pains proceeding in the same regular manner. Towards the morning, I found, upon examination, that very little ground had been gained; and, knowing that she was considerably advanced in age, and it being her first child, I made up my mind to wait patiently for the dilatation of the os uteri, as I had been often wont to do before, considering that it was one of those tedious labours so frequently met with, and which would require a long time for its completion. The os uteri was neither hot nor swollen; nevertheless, I endeavoured to accelerate its dilatation by general bleeding, and by injections per anum; but, in spite of measures of this kind, the progress of the labour was not promoted, and at the expiration of six days, the os uteri was not dilated to more than half its full diameter, although the pains had, during the whole of this period, continued regularly once in about seven minutes. I now requested a consultation; and having obtained the co-operation of a most respectable practitioner, it was decided that the os uteri should be artificially dilated. The operation gave *great pain*, but the head very soon dropped into the vagina. We waited a few hours for the natural efforts to expel the head through the vagina; but, finding that her strength would not be adequate to the expulsion, I delivered her with the forceps. The placenta was thrown off by the uterus; and, as might be expected, such a profuse hemorrhage followed, as to place the patient in the greatest danger. She recovered from the immediate effects of the flooding; but in a few hours violent pain of the abdomen ensued with ardent fever. These symptoms were succeeded by convulsions, which terminated in her death about the third day after her delivery.

This case occupied an almost unprecedented time in uterine dilatation, to administer an emollient glyster of gruel and castor oil. By these means, the progress of the labour will frequently be so forwarded as to require no further interference. On this subject Burns says, "It is also useful to detract blood, if the os uteri be rigid, the parts not disposed to yield, and the pains very severe. It is peculiarly proper, when the woman has vigour, when the organs are firm, and the pains lingering; it causes relaxation and quickens the pains."—*Burns' Principles.*

In cases rendered tedious by a scirrhosity of the os uteri, what treatment would you adopt?

698. This is indeed a dreadful aggravation of the pains of labour, and happily is of rare occurrence.* It will be best

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and had Doctor Denman met with such, he never would have handed down the rule above quoted, and which was acted upon in this instance. In my judgment, the os uteri ought to have been dilated about the second day; then the natural efforts might have been equal to the expulsion of the child; and it is probable, there would have been less hemorrhage and no inflammation, nor convulsions.

But it may be asked, Were not the symptoms of inflammation and convulsions occasioned by the artificial dilatation of the os uteri? I grant that the dilatation gave great pain; but, in my opinion, the unfavourable result ought to be attributed to the more obvious cause of reaction consequent upon such long-continued labour.

Again—It might be said that this case can be taken only in the light of a very rare occurrence; and, therefore, that it would be safer to the public that such should be left to take its course, whatever may be the result, than that the rule of Doctor Denman should be disturbed. For myself, I should say, that the safest practice will be found between these opinions.

To lay it down, as an invariable rule, that the os uteri ought never to be artificially dilated to expedite labour, rendered extremely tedious from rigidity alone, would be, I believe, contrary to the candid opinion of most of the experienced practitioners in midwifery. On the other hand, were I to presume to qualify Doctor Hamilton's and Mr. Burns' advice on this important point, I should say, that we ought to wait twenty-four hours before we attempt to interfere with the natural process by artificial dilatation; and, moreover, I would strongly recommend every young practitioner in midwifery not to attempt to dilate the os uteri in this case, until his judgment has been matured, and his hand become skilful by experience.

Since the occurrence of the above unfortunate case, I confess to have acted on the principles of Doctor Hamilton, as often as circumstances required; and I verily believe, that by a conscientious and cautious observance of his practice, many evils might have been and might be averted.

* Case—A lady, about 40 years of age, who had borne several children, and whose labours had been short and natural, became again pregnant, and fell into labour with her seventh child. The presentation was natural, but the first stage of labour was far more tedious than usual with her. At first,

palliated by avoiding digital examination as much as possible; by blood-letting; by emollient glysters, and a cooling diet.

VAR. 3. *A vi membranarum.* From the unyielding state of the membranes.

Does it ever occur that the membranes themselves are sufficiently strong to resist the passage of the child?

699. It now and then happens that, after the os uteri has been completely dilated, the pains are rendered inefficient to propel the child through the pelvis, by the resistance of the membranes.

How would you remove this impediment?

700. By rupturing them.

Are the membranes ever so unyielding as to render their being ruptured, difficult of accomplishment?

701. The practitioner may sometimes find a difficulty in doing this; but by pressing the membranes against the head, with the forefinger, or scratching them against it, during a pain, they will usually give way.*

VAR. 4.—*A rigidâ vaginâ.* From rigidity of the vagina.

Is not rigidity of the vagina frequently the cause of impeded labour?

702. It often occurs that, along with a rigidity of the os uteri, there is the same unyielding state of the vagina, and to such a degree as to render the natural pains unable to expel the child. This most commonly happens in

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the cause did not immediately appear; but, as the os uteri became more dilated, its scirrhosity was easily discoverable by the finger. The progress of dilatation continued to be remarkably tedious; and as the cervix of the uterus became flattened by the pressure of the head of the child, it felt more like the compactness of wood than the natural structure. The first stage being at length completed, the child was soon expelled through the vagina; the placenta was thrown off naturally, and all things went on tolerably well for a short time. It was easy, however, to predict the sequelæ of such a case. Before long, the morbid action increased, and ulceration followed, accompanied by that awful train of symptoms, which constitutes, perhaps, the most distressing example of human misery; and which cannot but call forth the greatest commiseration and the tenderest sympathies of our nature.

* Not being able to penetrate the membranes, in consequence of my nail becoming soft by repeated trials, I succeeded by wearing on my index finger a new thimble.

first labours, and more especially in women advanced in years. It does not, however, follow that every stage of labour is equally tedious; for sometimes the uterine stage will be found tedious, whilst the vaginal shall be completed in a more rapid ratio; and vice versâ.

Describe the state of the parts as they are found in this case.

703. "It is known under the name of the case of arrest, or by the French writers, la tête arretée au passage. The head is not fixed or jammed; the finger can readily be passed around it; the scalp may be swelled, but the bones are never misshapen, and the retardation appears to arise rather from the nature of the pains, or the unyielding state of the soft parts at the outlet of the pelvis, than from any actual obstruction, offered by the pelvis to the delivery."—*Burns' Principles.*

May not a case of mere suspension be mistaken by an inexperienced practitioner for that of arrest?

704. This cannot well happen—for in cases of suspension, although the head of the child will be found out of the uterus, either at the upper aperture, if descending into the cavity of the pelvis, or lying upon the perinæum, there will have been little or no uterine exertion—there will be no swelling of the scalp of the child; no distress of countenance; no anxiety of mind; no calls for assistance on the part of the patient; and no apprehension on the part of her friends, as in the case either of arrest or infraction.

Do cases of arrest always require the assistance of art?

705. "There are many cases of arrest which are safely terminated by nature, and which are placed under the class of tedious labours. It ought to be laid down as an invariable rule in cases of this kind, where the pelvis is sufficiently capacious for the passage of the head of the child, that as long as the expelling pains *continue strong*, and return at natural intervals, so long we have a right to expect the birth of the child to be ultimately effected by the powers of nature: but there are many cases also that require to be accelerated by artificial force."—*Burns' Principles.*

What would be the probable result, were cases of arrest left to the unassisted efforts of nature?

706. In the great majority of cases, the child might be at length expelled; but the muscular power of the uterus would be so much exhausted by long-continued action, as to expose the woman to retention of the placenta, to irregular uterine contraction, hemorrhage, inflammation, and fever—to say nothing of the hazard to the child. In this I am borne out by

experience; for "we find that a much larger proportion of women die after protracted than after natural labour."—*Ibid.*

State the period at which you would interfere, and when farther delay would probably be disadvantageous or even hazardous to the patient.

707. "In this case, presuming that the rule has been acted upon of having the first stage accomplished within a certain number of hours of actual labour, I am inclined to lay it down as a principle, that the second stage should be accomplished within a little longer time than was allowed for the first. But to prevent all mistake in a rule which is connected with time, I must again expressly state, that, as I formerly spoke of the first stage being accomplished within a certain period of actual labour, and dated from the commencement, not of mere pain, which may not even have been truly uterine, but of pain affecting the os uteri; so the second stage is to be considered also as a state of uterine pain, and is not to have included in its duration the hours of suspension, which may have been passed in sleep or tranquillity. When I come to lay down a rule as to the time of interference, I would say, and that from reflection and experience, that few cases ought to be trusted to nature for thirty-six hours, and, in general, it is safe and proper to interfere within thirty. There may be cases, where particular symptoms shall justify and call for aid even within twenty-four hours, and an impacted head may demand it within that time: but in an ordinary state of health and strength, a mere case of arrest may be safely trusted till between twenty-four and thirty-six hours; and the point of interference within this range of twelve hours must be regulated by the efforts, which have been made, the uninterrupted continuance of labour, the obstinacy of irregular action, the situation of the head, or length of time it has remained in a situation rendering the forceps applicable, and last of all the general vigour of the patient. Finally, the longer the first stage has been protracted, and the more painful it has been, the shorter would we wait in the second, and vice versâ. This remark, however, is only applicable in cases of arrest and not of impaction.

"The doctrine I have now been supporting rests on this principle, that it is safer to extract the child with the forceps than to allow the uterus to remain long in a state of action, whether that be regular or spasmodic, or whether it lead directly to a state of exhaustion, or ultimately to disease arising from irritation."—*Burns' Principles.*

But is not this practice very much at variance with the rules laid down upon this subject by a late celebrated accoucheur, and one of the best practitioners of the time in which he lived?

708. Denman certainly legislated that the head should have rested on the perineum, after the pains had ceased, during six hours, previous to the use of the forceps; but this rule is founded on the error of over-caution—and at the same time that it guards the patient against any rash and impatient conduct of the young practitioner, exposes her to the far more serious results of retained placenta, hemorrhage, fever, and a train of consequent evils.*

What are the means by which you would deliver the patient?

709. The forceps.

Would you not administer the ergot of rye, to expedite the delivery, rather than resort to the use of the forceps?

710. The ergot ought never to be given to overcome resistance; for, should the resisting power be more than equal to that of the uterus, even when vehemently excited, a rupture of the womb may be the consequence. In this opinion I am supported by Doctor Blundell, who says, "Do not administer ergot or other stimuli in these cases:—they are injurious."—*Lancet.*

You mention the forceps as the best instrument in this case—why do you prefer it to the lever?

711. Because the forceps, when cautiously and seasonably applied, is not only compatible with the life of both the mother and the child, but injurious to neither; whereas the vectis is frequently injurious to both.

In what respects does it preserve both mother and child from injury?

712. 1st. It depends on its own fulcrum, and, therefore, does not bruise the soft parts of the mother.

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* Doctor Blundell, in his Lecture on this subject, says that the use of instruments is not justifiable, unless dangerous symptoms are apparent, till a woman has been in strong labour twenty-four hours after the discharge of the waters.—*Lancet.*

My own opinion as to the time when a woman ought to be delivered by instrumental aid in tedious labour of this kind, supposing the os uteri to be fully dilated, is, that such a necessity will be always indicated to the observing practitioner by the worn-out state of the patient, the gradual declension of the pains, and the want of progress in the presentation. A concurrence of these circumstances cannot take place till a woman has been for a considerable time in labour; and when they do occur, laying aside the measurement by the number of hours, *then* is the precise time for instrumental delivery.

2dly. It acts principally by simple traction, and therefore does not injure the scalp or bones of the head of the child by partial pressure.

3dly. Its blades, when shut to their maximum, leave an elliptic space, the diameter of the centre of which is not less than three inches, and therefore cannot injuriously compress the contents of the head of the child.

Are there not remedies to be used in the course of a tedious labour of this kind, that may lead it to a natural termination, and thus render the interference of instruments unnecessary?

713. An emollient glyster of gruel and castor oil should be from time to time thrown up the rectum—and adequate venesection employed, if the rigidity be extreme.

Would you use the forceps before the os uteri is completely dilated?

714. Before the os uteri is fully dilated, and the head of the child has descended out of the uterus, the forceps cannot even be contemplated.

Is there any guide, by which you could know that the head has descended far enough within the pelvis to allow of being grasped by the forceps in common use?

715. As soon as the ear of the child can be felt by the finger in a common examination, we know that it may be extracted by the forceps.

Are there not some steps to be taken preparatory to the introduction of the forceps?

716. It will be always right to assure ourselves of the vacuity of the bladder and rectum, by the use of the catheter and the injecting syringe.

What kind of forceps would you prefer in an ordinary case of arrest?

717. The forceps with a single curve may, I believe, be very safely and easily employed; but it is usual to prefer those that have the blades curved laterally also.

State the mode of their being applied.

718. Having explained the necessity of using them to the patient and her friends, she is to be placed in the usual position on her left side, near to the edge of the bed; and the instruments, warmed in hot water and smeared with some unctuous application, are to be used in the following manner.

"1st. Carry the fore-finger of the right hand to the ear of the child, which will be found toward the ossa pubis or under one of the rami ischiorum.

2dly. Then take the blade of the forceps to be first introduced, by the handle, in the left hand, and conduct it between the head of the child and the finger already introduced, till the point reaches the ear.

3dly. The farther introduction must be made with a motion, resembling a slight degree of semi-rotation, and the point of the blade must be kept close to the head of the child, by gently raising the handle, as the instrument is advanced.

4thly. The blade of the forceps must be carried up till the lock reaches the external parts, near the inferior edge of the ossa pubis.

5thly. Should any difficulty occur in the introduction of either of the blades, we must withdraw them a little, to discover the obstacle, and never strive to overcome it with violence.

6thly. When the first blade is introduced, it must be held steadily in its situation, as it will be a guide in the introduction and application of the second blade.

7thly. The second blade of the forceps must be conducted upon the fore-finger of the left hand, passed between the head of the child and the perinæum, in the same cautious manner as the first, till the lock reaches the perinæum, or even presses it a little backward.

8thly. When the second blade is properly introduced, its situation will be opposite the first.

9thly. In order to lock the forceps, the handles of which are at a considerable distance from each other, the blade first introduced must be brought down, and carried so far back that it will lock with the second blade, held in its first position.

10thly. Care should be taken that nothing be entangled in the lock of the forceps, by carrying the finger around it.

11thly. It is convenient to tie the handles of the forceps together when locked, with force sufficient to keep them from sliding or shifting their position.

12thly. If the blades of the forceps were introduced so as not to be opposite to each other, they could not be locked.

13thly. Should the handles of the forceps, when applied, come close together, probably the bulk of the head is not included between them, and, therefore, when we acted with them, they would slip.

14thly. If the handles when locked are at a great distance from each other, they are not well applied, and will probably slip.

15thly. But in these estimations, allowance is to be made for the different dimensions of the heads of children.

16thly. The forceps will never slip, if judiciously applied, if the case be proper for their use and we act circumspectly with them."—*Denman's Aphorisms.*

Having thus applied the forceps, in what manner would you extract the head of the child?

719. "1st. There is no occasion, and it would be hurtful to attempt to change the position of the head with the forceps before we began to extract.

2ndly. For if the action with the forceps be slow, the head of the child will turn in the same manner and for the same reasons as in a natural labour.

3dly. Therefore, the forceps being fixed upon the head, must also change their position according to its descent, and the handles be gradually turned from the ossa pubis and sacrum, where they were first placed, to the sides of the pelvis.

4thly. The handles of the forceps likewise, though originally placed far back towards the sacrum, that is, in the direction of the cavity of the pelvis, are to be gradually turned as the child advances more and more towards the pubes, that is, in the direction of the vagina.

5thly. The first action with the forceps must be to bring the handles, firmly grasped in one or both hands, slowly towards the pubes, till they come to a full rest.

6thly. After waiting till the pains return, or an imaginary interval, if there should be a total want of pain, the handles are to be carried back, in the same slow and cautious manner, to the perinæum, using at the same time a certain degree of extracting force.

7thly. The subsequent action must be from handle to handle, or occasionally by simple traction; but the action of the blade, which was towards the pubes, must be stronger and more extensive throughout the operation than the action with the other blade, which has no fulcrum to support it.

8thly. By a repetition of these actions, always directed according to the position of the handles, with their force increased, diminished, or continued, according to the exigence of the case, we shall in a short time perceive the head of the child descending.

9thly. When the head begins to descend, the force of the action with the forceps must be abated; and as that advances, the directions of the handles must change by degrees more and more to each side and towards the pubes.

10thly. The lower the head of the child descends, the more gently we must proceed, in order to prevent any injury or laceration of the perinæum or external parts, which are likewise to be supported in the same manner as in a natural labour."—*Denman's Aphorisms.*

What space of time does this operation usually occupy in the delivery of the head of the child?

720. This must ever depend on the resistance to be overcome; "so that one operation may be safely and easily finished in twenty minutes, or even a less time, and another may require more than an hour for its completion, and the repeated exertions of very considerable force."—*Ibid.*

Is not the perinæum in greater danger of being lacerated by the use of the forceps than when the head is expelled by the natural efforts?

721. Every practitioner ought to be most careful to support the perinæum with his left hand during the extraction of the head of the child; for although the blades of the instrument, as the head passes over the perinæum, are opposed to the rani of the pubes, the perinæum, being put more upon the stretch by the additional bulk of the forceps, is thereby more endangered, and consequently requires the greater circumspection and support.

VAR. 5.—*A deformitate.* From disproportion between the cavity of the pelvis and the head of the child.

What is the measurement from the symphysis of the pubes to the top of the sacrum in the adult female, supposing the pelvis to be well formed?

722. Four inches.

State the measurement of the lateral and diagonal diameters of the brim.

723. Five inches and a quarter is the lateral, and five inches and one-eighth the diagonal diameter.

State the longest diameter of the outlet of the cavity of the pelvis and its measurement.

724. "The long diameter extends from the symphysis pubis to the coccyx, and measures, when that bone is pushed back as in labours, five inches; but an inch less, when it is not."—*Burns' Principles.*

What does the transverse diameter measure?

725. The transverse diameter, that is, from one tuberosity of the ischium to the other, measures four inches.—*Ibid.*

State the breadth of the base of the pubic arch.

726. Four inches—and a perpendicular line, drawn from the centre to the base, is fully two inches long; whilst the top of the arch will permit a circular body to come in contact with it, whose diameter is an inch and a quarter.—*Ibid.*

State the principal measurements of the walls of the pelvis.

727. The pelvis is of unequal depth—" At the back part it measures from five to six inches, according as the coccyx is more or less extended; at the side, a line drawn from the brim to the tuberosity of the ischium measures three inches and three quarters; at the fore part the depth of the symphysis pubis is an inch and a half."—*Ibid.*

What are the measurements of the pelvic space?

728. " An oblique line, drawn from the sacro-iliac junction on one side down to the opposite tuberosity, measures six inches; and the long axis of the child's head, before it takes the turn forwards, corresponds to this line. From the ramus of the ischium to the opposite sacro-iliac junction is five inches. From the top of the arch of the pubes, or orifice of the urethra, to the second bone of the sacrum, is four inches and five-eighths to five inches. A line drawn from the top of the arch to the top of the sacrum is about a quarter of an inch more than the short diameter of the brim. From the top of the arch to the spine of the ischium is three inches and a half. From the tuberosity of the ischium to the centre of the sacrum is four inches. From the back part of the tuberosity to the sacro-iliac junction of the fore part is three inches and a half. From the extremity of the tuberosity to the spine of ischium is two inches. From the spine to the sacrum is two inches; and from the top of the arch of the pubis to the plane of the ischium is two inches. The breadth of the plane itself is two inches: so that a line, traversing these different parts from the symphysis to the sacrum would measure, including its slight irregularities, six inches. From this tuberosity to the inferior part of the thyroid bole is an inch and a half. The long diameter of the sacro-sciatic notch is two inches and three-eighths; the short, one inch and three-fourths."—*Ibid.*

Is the brim parallel with the outlet of the pelvis?

729. On the contrary, they are placed at a considerable angle.

How would you represent the axis and outlet of the brim?

730. A line drawn from the umbilicus downwards, and backwards to the coccyx, describes the axis of the brim, and that of the outlet by a line drawn from the orifice of the vagina

to the first bone of the sacrum. A good idea of the passage of the child's head in these axes will be obtained by placing a male catheter of the usual curvature, in the axis of the brim, and making its extremity pass out at the axis of the outlet.—*Ibid.*

State the principal measurements of the child's head at the full period of gestation, supposing it to be well formed.

731. The longest diameter of the head is from the vertex to the chin, and this is near five inches. From the root of the nose to the vertex, and from the chin to the central portion of the sagithal suture measures four inches. From one parietal protuberance to the other, a transverse line measures from three inches and a quarter to three inches and a half. From the nape of the neck to the crown of the head is three inches and a half. From one temple to the other is two inches and and a half. From the occiput to the chin, along the base of the cranium, is four inches and a half. From one mastoid process to the other is about two inches. From cheek to cheek is three inches.—*Ibid.*

May these natural dimensions of the head be influenced by its passage through the pelvis?

732. Owing to the sutures, the size may be materially diminished, and its shape altered.

What is the diameter of the head as a circular body, as it passes through the brim of the pelvis?

733. Three inches and a half—and thus no obstacle or difficulty can arise from the size of a pelvis which measures, in its short diameter, cæteris paribus, four inches.

Describe briefly the passage of the head of the child through the axis of the pelvis and vagina in a natural labour.

734. In its descent through the axis of the pelvis, "the head naturally is placed with the vertex directed to one side, or a little towards the acetabulum, and the forehead, owing chiefly to the action of the promontory of the sacrum, is turned in the same degree towards the opposite sacro-iliac junction. But when, by the contraction of the uterus, the head is forced a little lower, its apex comes to touch the plane of the ischium. Upon this, the posterior sloping part of the parietal bone slides downwards and forwards, as on an inclined plane, the head being turned gradually, so that in a little time, the face is thrown into the hollow of the sacrum, and the vertex presents at the orifice of the vagina,"—*Ibid*—in the axis of which it gradually advances and is expelled.

Compare the relative diameters of the child's head with the pelvic diameters, as it passes through the pelvis.

735. As it passes through the brim,

Long diameter of the head, near five inches.
Long diameter of the pelvis, five inches and a quarter.
Short diameter of the head, three inches and a quarter to a half.
Short diameter of the pelvis, four inches.

As it lies diagonally across the cavity of the pelvis,

Long diameter of the head, near five inches.
Pelvic diameter from the sacro-iliac junction to the opposite acetabulum, five inches and one-eighth.

As it passes out in the axis of the vagina,

Long diameter of the head, (i. e.) from chin to vertex, near five inches.
Long diameter of the pelvic outlet, (i. e.) from the end of the os coccyx, *when pushed back* to the symphysis of the pubes, five inches.—*Vide Ibid.*

What is the result of a relative disproportion of these diameters?

736. Interrupted parturition, ranging from a tedious labour, accomplished finally by the natural powers, to one altogether impracticable, through the pelvis, either by nature or art.

What is the denomination given to labours of the first degrees of difficulty from this cause?

737. The are called cases of impaction.

What are the local circumstances signified by this term?

738. The term, impaction, is signified, when, after the full dilatation of the os uteri, the head is pushed more or less into the cavity of the pelvis by the force of the pains, and locked therein by the diminished size of the pelvis. The case will be farther manifested by the swollen state of the vagina, by the œdematous swelling of the scalp, by the overlapping of the bones of the head at the sutures, and by the unavailing, though strong, efforts of the uterus. "But when we talk of a case of impaction, we must not suppose that the head is literally and entirely immoveable. That it is, in the strict sense, sometimes impacted, and cannot be moved, is no doubt true; but more frequently the hand can make it recede a little, although the uterus cannot make it advance any more."—*Burns' Principles.*

Are there not some cases of impaction, properly so called, that may be safely completed by the natural powers, and, therefore, do not require the interference of art?

739. There are cases, where the deformity is so slight, that

the head of the child, by the overlapping of its bones at the sutures, may be sufficiently diminished to admit of its passage through the pelvis by the natural powers alone. In such cases, so long as the head shall make a satisfactory progress, we are not justified in affording instrumental aid.*

Suppose, however, that a satisfactory progress were not made by full uterine pains in a case, bearing the characters of impaction, how long would you wait before you had recourse to instrumental delivery?

740. Our conduct in a case of impaction must not be influenced by a principle of time, but by the nature of the impaction alone. As soon as we are convinced either that the expulsion of the head cannot be effected by the natural pains, or without a very long and hazardous labour, we ought to be decided in our practice, and deliver without any farther delay.

What are the consequences to which a woman is exposed by long delay in a case of impaction?

741. Besides the train of evils consequent upon a long and severe labour from other causes, and which have been enumerated in the case of arrest, she would be liable also, by the continued and strong efforts of the uterus, to puerperal convulsions, and to sloughing of the vagina, bladder, and rectum.

What instruments would you employ to deliver the patient of her child, supposing the head to present?

742. This must ever depend on the situation of the head. Should we be enabled to feel the pubic ear in a common examination, we should proceed deliberately to deliver with the forceps, in the manner before mentioned (718); but if the head shall not have entered the cavity of the pelvis, or not be sufficiently low to allow of our feeling the ear, the head should be lessened by the perforator, and delivered by the crotchet.

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* I say satisfactory; because a case may occur, in which, by comparing the progressive difference every twelve hours, an advance will be discovered; and yet it shall be so slow, and require such extreme and long-continued exertion as to endanger the life of the mother by its consequences. Many a life has fallen a sacrifice to a want of decision in labours of this character. It is true that, after several days of toil and agony, the child may be expelled by the uterine pains, unaided by art; and we may, at that happy moment, hear praises lavished upon the all-patient practitioner; who will exultingly respond, "There is nothing like patience." Yes, forsooth, there is indeed nothing like patience in an impacted labour, to produce all the miseries of a sloughing bladder, and a never-ceasing incontinence of urine.

Might not the long forceps be adequate to the delivery, and thus save both lives?

743. Much has been vaunted in favour of the long forceps; and some have used and recommended them as a practicable instrument, when the head is too high for the common forceps, and when the short diameter of the brim of the pelvis measures quite three inches. But I do not acknowledge the use of such an instrument; and, if employed under such circumstances, it can hardly fail of being mischievous to the mother; for if the short diameter of the pelvis be no more than three inches, and if the widest breadth of the cavity, within the blades of the forceps, be no less, it is pretty certain, that the head cannot be brought down without severe contusion of the soft parts of the mother, and most probably of the bladder. Besides, should not the os uteri be completely dilated, it is possible that they may be applied over its margin, and thus do incalculable mischief. Looking, then, at the probability of such results, in connection with the no common difficulty of their application, preference is always to be given to the perforator and crotchet.

Would you not apply the vectis or lever in such a case?

744. I see no reason to prefer the lever to the long forceps, as the same objections would lie against the former instrument.

Is not the perforator a dangerous instrument to the mother as well as fatal to the child?

745. In the hands of a rash and incautious practitioner, it undoubtedly is, and so are all instruments; but in the hands of one who thinks attentively, and acts circumspectly, its use is perfectly safe to the mother, and the operation to be performed with it of the most simple and easy kind.

Describe the operation of fœtal craniotomy.

746. The patient being placed on her left side, near the edge of the bed, in the manner recommended in the delivery with the forceps, and the bladder and rectum being emptied, the left hand, having been previously smeared with lard, is to be introduced into the vagina, with the back towards the sacrum, and two or more fingers planted upon the scalp, around the point to be perforated. The perforator is to be passed through the vagina, closely upon the hand, with its convexity towards the palm, till its beak touches the above point. Thus directed, and guarded by the hand and fingers, it is to be pushed steadily forward with a semi-rotatory motion, till it has penetrated the cranium to the stop. The perforation is now to be

dilated by separating the handles; after which, the instrument is to be turned upon its edges, and a similar dilatation made at right-angles with the first. This being done, the perforator is to be carefully withdrawn, and the texture of the brain and cerebellum broken down with the crotchet.*

Would you immediately begin to extract the head with the latter instrument?

747. Supposing the short diameter to be, in the present instance, three inches, I should leave the case for a while to nature, in the hope that the head thus lessened, may be expelled by the pains.

Is this operation followed by hemorrhage?

748. This will depend on the child being alive previously to the craniotomy, or otherwise. In the former case, I should expect a considerable bleeding from the cerebral arteries; but, being aware of its origin, it would not occasion me any embarrassment.

Is it important that you should possess yourself with the knowledge of the child's being alive or dead previously to the operation?

749. Such a knowledge is immaterial; the operation is, or is not, positively necessary. If it be, the child being alive, is to be sacrificed for the welfare of the mother; if not, such an operation could not be contemplated.

Is not great caution necessary in the use of the crotchet, lest it slip during the forcible extraction of the head, and injure the soft parts?

750. Yes; and in order to prevent such an accident, the left hand should be kept in the vagina to guard the action of the crotchet, as long as possible.

Have you the means of ascertaining a small pelvis at the onset of a labour?

751. The hand is the best pelvimeter; and if, in a common examination, the fore-finger can reach the projecting angle of the sacrum, we may safely infer, that the short diameter is not more than three inches, and, therefore, indicative of a difficult labour.

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* Some persons substitute other instruments for the crotchet, such as small forceps, or a kind of crutch. Mr. Pitman, of Andover, a very zealous and skilful practitioner, is, I am told, in the habit of using a tire-tête, made of a short rounded piece of wood, with a cord or tape fastened around its middle, which he has found a very simple and convenient tractor; but this, of course, is applicable only in the slighter degrees of distortion, where the head has been pushed below the brim of the pelvis.

Are there not instances, wherein children have been born alive with the natural pains, through a pelvis measuring only three inches?

752. "There have been instances where, even by the efforts of nature, living children have been expelled through a pelvis measuring only three inches; and there are similar examples of the delivery being, under the same conformation, accomplished by instrumental aid. Every one knows, that even at the full time, the child is sometimes very small; or the head, when not very diminutive, may be extremely pliant. We are not warranted, therefore, instantly to open the head, merely because we estimate that the pelvis does not, in its conjugate diameter measure fully three inches; but because we have ascertained by a sufficient but not a dangerous trial, that the uterine action cannot force down the head."—*Burns' Principles.*

Is it possible for an ordinary sized head, at the full time, to pass through the upper aperture of a pelvis, whose short diameter measures only two inches and a half?

753. It is universally agreed that it cannot.

In such a case, would you not perforate the head as soon as possible?

754. For the advantage of the mother it ought to be perforated, "as soon as the os uteri is properly dilated; and this ought always to be effected in, at the farthest, the time formerly specified (twelve hours), but, until the os uteri be fully opened, no attempt to introduce the perforator can be sanctioned."—*Burns.*

As you may possibly be mistaken as to the exact measurement of the pelvis, would you not wait a reasonable time to ascertain the result of the pains?

755. As has been just stated, we are not to proceed to use the perforator, until we have waited a reasonable time (more or less, according to our opinion of the measurement of the short diameter of the pelvis), to estimate the effects of the labour pains, and if the head should be pushed in some degree into the cavity of the pelvis, (though not low enough for the pubic ear to be felt) we ought not to perforate the head, until we have made a fair and cautious trial of the forceps.

Should you not be able to feel the promontory of the sacrum, and should you, in a common examination, have no reason to suspect a diminished size of the pelvis, and at the *same time should the full force of the uterine action be unable to push the head through the upper aperture of the pelvis, to what cause would you impute the impediment?*

756. "To the great size of the child and firmness of the cranium, or to a hydro-cephalic state of the head."—*Ibid.*

How would you act in such a case?

757. Precisely in the same manner as if the pelvis were deformed; for, in fact, it is too small to allow the head to pass under such a state of firmness and enlargement; and, therefore, the head ought to be lessened according to the rules already laid down.

What are the shortest diameters of the upper aperture of the pelvis, that will allow of instrumental delivery per vaginam?

758. "The crotchet cannot be used, when the child is of the full size, unless we have a passage through the pelvis measuring fully an inch and three quarters in the short diameter, and three inches in length; or if the child be premature and soft, an inch and a half broad, and two inches and three quarters long."—*Burns' Principles.*

When the short diameter is very small, can you, after the evacuation of the brain, extract the whole of the bones of the cranium at once, by the aid of the crotchet, aided by the compressing power of the uterus?

759. This will always depend on the relative size of the head to the pelvis. When the pelvis is extremely reduced below the natural measurement, and the head is of the ordinary size, this will be impracticable. In such a case, it will be necessary to break down and first extract the whole of the bones of the head above the level of its base, in order that the base of the skull and the face only may be left to pass the narrow aperture. And the more the conjugate diameter approaches the minimum just mentioned, the greater will be the necessity of doing so, and vice versâ.

Are you not an advocate for perforating the head as early as possible in cases of extreme distortion of the pelvis?

760. The more the distortion approaches the short diameter of one inch and three-quarters, i. e., the minimum that will admit of practical labour, the earlier ought the perforation to be made.

State your reason for this.

761. In order that by putrefaction (according to the opinion of Doctor Osborn and Doctor Denman), or by a softening of the bones by the pressure of the uterus (according to Mr.

Burns) the extraction may be ultimately more easily accomplished.

As these processes require delay, I presume that you would not in this case use the crotchet for some time after the perforation?

762. Doctor Osborn states, in his Essays, as follows:—"That the young practitioner may be directed in all circumstances, which admit and require precision, I would recommend the delaying all attempts to extract the child till the head has been opened at least thirty hours; a period of time sufficient to complete the putrefaction of the child's body, and yet not sufficient to produce any danger to the mother. From such conduct, the beneficial effects of facilitating the extraction of the child, I am firmly convinced by frequent experience, will much overbalance any possible injury which may reasonably be expected from the putrid state of the child and secundines in so short a time."—*Osborn's Essays.*

You speak of the early perforation of the head; do you mean in cases of extreme distortion, that you would perforate the head before the dilatation of the os uteri, which you have disapproved of, upon the authority of Mr. Burns, in cases where the pelvis was diminished in a less degree?

763. This case must be considered an exception to the rule, for where the os uteri lies wholly above the upper aperture of a pelvis of such small dimensions, it will not be possible to dilate it artificially at all; upon which dilatation, Mr. Burns' rule is founded; and, therefore, as soon as it is naturally dilated to a sufficient degree to admit of the introduction of the perforator, the operation ought to be performed, with a view to bring about a detached or loose state of the bones by putrefaction: "For if we do not perform the first part of the operation till the labour has been protracted so long, as that the woman's strength begins to fail, we must expedite the delivery as speedily as possible, otherwise the danger, which we wish to avoid, will infallibly be incurred: no woman can suffer continued labour, beyond a certain period, without fever, inflammation, and the most imminent danger, if not death, ensuing."—*Osborn's Essays.*

Does not this operation, in such a great degree of deformity, always require the greatest care and caution in its performance?

764. This is an operation which ought never to be performed by a young practitioner, without a deliberate consultation, if such can be had. The rectum and bladder should be

emptied, the left hand kept constantly in the vagina to direct the introduction of the crotchet or such other tractors as may be used, and to guard the soft parts against the ill effects of their slipping from their hold, during the efforts of the operator. Our first object will be to bring away all the bones above the base of the skull, either by pincers made for the purpose, or the crotchet, and lastly, to extract by the latter the base of the skull.

What presentation of the base will pass the upper aperture of the pelvis most readily, supposing the short diameter to be only one inch and three-quarters?

765. Mr. Burns says, "I have carefully measured these parts, placed in different ways, and entirely agree with Doctor Hull, a practitioner of great judgment and ability, that the smallest diameter offered is that, which extends from the root of the nose to the chin. For, in my experiments, after the frontal bones were completely removed, this did not in general exceed an inch and a half. It is, therefore, of great advantage to convert the case into a face presentation, with the root of the nose directed to the pubes."—*Burns' Principles.*

In what other position might you place the base of the cranium with the probability of bringing it through the upper aperture of the pelvis?

766. Doctor Osborn, speaking of the case of Elizabeth Sherwood, says, "I was fearful of being foiled in the completion of the delivery, till I thought of changing the position of the head, by turning it sideways; for by that means the relative volume was very considerably diminished." He, therefore, prefers this position of the head, and says, that in such position, the short diameter of the base of the cranium does not exceed an inch and a half.—*Osborn's Essays.*

But is it always possible to follow these instructions precisely?

767. It is impossible to lay down rules to meet the difficulties and peculiarities of every case that may occur to us. We must, by perseverance and the greatest caution, bring away all the bones situated above the base of the skull; and then, having ascertained which side of the pelvis will most advantageously allow of the passage of the remaining part of the head, proceed to deliver according to the instructions of those, whose experience and skill enable them best to guide us; and if we should find it impracticable from the peculiarities of the case, to obey them, to deliver in the best way we can—

always remembering the words of Celsus, "tutò, citò, et jucundè.

Are there any other means of delivering the head per vaginam after it has passed the upper aperture, besides the crotchet?

768. This may sometimes be done by firmly grasping the integuments of the cranium, and pulling them in a proper direction.

After the delivery of the head of the child, might not the remainder of the body be impeded by the pelvis?

769. This will probably be the case; but as, by the head being delivered, we shall have great control over the rest of the body, the difficulty will be more easily overcome; yet, if by the greatest force we may deem it prudent to exert, we should not be enabled to bring the chest through the upper aperture, we must open the thorax, and cautiously deliver by the crotchet or blunt hook.

What are the shortest diameters of the chest, shoulder, and pelvis of an ordinary child, at the full period of utero-gestation, when compressed into the smallest space?

770. The shortest diameter of the chest is an inch and a half, that of the pelvis is the same, and that of the shoulder is one inch.—*Burns' Principles.*

Is not great force sometimes necessary to deliver a child where the deformity is considerable?

771. "Where the deformity is considerable, no small force is requisite. This is productive of pain during the operation, and of danger and inflammation afterwards."—*Ibid.*

Are any measures necessary, after the delivery is complete, to prevent, as much as possible, these results?

772. Should the labour have lasted a long time, and the vaginal discharges be fetid, it will be advisable to throw up some tepid camomile infusion; it may be also necessary, if but little blood has been lost with the placenta, to bleed the patient, to give ten grains of the Dover's powder;* and, lastly, it will be of the highest importance that the antiphlogistic treatment should be most strictly observed.

What is signified by the term impracticable labour?

773. Impracticable labour is signified, when the birth of the child cannot be effected through the vaginal canal, either by the efforts of nature or the powers of art.

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* The Dovers powder was originally made with the nitrate, instead of the sulphate, of potass, and the former I would advise to be used in this case.

What is the cause of such impracticability?

774. An extreme diminution of the upper aperture of the pelvis.

State the precise measurement of this aperture that will not allow of practicable labour.

775. According to Mr. Burns, a pelvis, which in its short diameter measures less than an inch and three quarters, and in its long diameter less than three inches.

According to Doctor Osborn, less than two inches long, and and an inch and a half wide.

According to Doctor Denman, a pelvis very little exceeding one inch in its short diameter.

By what means would you be enabled to ascertain the precise measurement of the upper aperture?

776. By introducing my hand into the vagina, and by ascertaining how many fingers could be placed within the short diameter, and then by measuring them as accurately as possible. As has been said before, the hand is the best pelvimeter.

By which of the above authorities would you be guided, with respect to the measurement of the upper aperture of the pelvis?

777. As all these authorities are respectable, I should be guided by that, most favourable to the patient; and, therefore, I should prefer the opinion of Doctor Osborn. But, although there would appear to be a material difference in their opinions on this most momentous point (for a quarter of an inch makes a material difference—nothing less than perhaps the very existence of the woman), still they may, in reality, be considered as equivalent to each other in a practical point of view. Burns contends, it is true, for three inches by one and three-quarters, for the passage of the base of the skull; but admits, that, should the head have been premature and soft, two inches and three-quarters by one and a half will be sufficient. Allowing, then, for the possibility of the head being small and soft, and for the probability of the small diameter being a little more than our measurement, I should say, that if our fingers assure us of a full inch and a half from pubes to sacrum, I should decide on the use of the crotchet.

On the other hand, should you be convinced that the pelvic upper aperture were actually under that measurement, what ought to be done to rescue the woman from her perilous situation?

778. Either the pelvic space must be enlarged, or the child

extracted through the belly by an operation, which may be called gastro-uterotomy.

By what method could you enlarge the upper aperture of the pelvis?

779. With a view to do this, it has been proposed to divide the symphysis pubis; and on the Continent, the operation has been performed frequently, but on this side of the water, the practice has not been approved.

Do you think this operation justifiable?

780. I should not consider it justifiable under any circumstances that can be supposed, so long as we allow the life of the mother to be paramount to that of the child. The forcible separation of the arms of a distorted pelvis to an extent, sufficient for the passage of the child, must infallibly destroy the patient.*

What would be your alternative in such a case?

781. The alternative is, indeed, tremendous to the mother; but, under such desperate circumstances, justifiable to the practitioner as the only possible way of saving her life. I should perform gastro-uterotomy, by which the child is to be extracted through the abdomen.

Is not this operation most severe, and almost always fatal to those, on whom it has been performed?

782. "There are, I think, histories of twenty-three cases, where this operation has been performed in Britain; out of these, only one woman has been saved, but eleven children have been saved."—*Burns' Principles.*

Suppose the woman to be affected with mollities ossium, a disease which, in manufacturing towns, generally gives rise to such degrees of deformity, would you feel justified in performing the operation?

783. The malacosteon, being of itself a fatal disease, ought undoubtedly to have great weight in our consultation, and to make us deliberately pause before we perform the operation.

Describe the manner of performing gastro-uterotomy.

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* Doctor Blundell, speaking on this subject, says, "If the joint be not merely divided, but if, moreover, the bones be separated from each other, to the extent of two or three inches, then, in consequence of the injury done to the sacro-iliac synchondrosis, and the lesion of the sciatic nerves, and the straining of the softer viscera, which are connected with the pelvis, the operation becomes one of considerable pain, and is, perhaps, scarcely less dangerous than the Cæsarean incisions themselves, even in the worst condition of that mode of delivery."—*Lancet.*

784. "The operation itself, although dangerous in its consequences, and formidable in its appearance, is by no means difficult to perform. Some advise the incision to be made perpendicularly to the linea alba; others, transversely, in the direction of the fibres of the transversalis muscle. Perhaps the precise situation and direction of the wound must be regulated by the circumstances of the case and the shape of the abdomen; but in general, I apprehend that the transverse wound will be most eligible. The length of the incision, through the skin and muscles, ought to be about six inches; and if a vessel bleed so as to require the ligature, it will be proper to take it up before proceeding further. The uterus is next to be opened by a corresponding incision; and as the fundus, owing to the pendulous shape of the abdomen, is the most prominent part, the incision will in general be made there, unless the external wound be made lower than usual. The child is next to be extracted, and immediately afterwards, the placenta. One assistant is to take the management of the child, whilst another takes care to prevent the protrusion of the bowels. In this part of the operation, although pretty large vessels are divided, yet the hemorrhage is seldom great: it has, however, proved fatal. The external wound is now to be cleaned, its sides brought together, and kept in contact by a sufficient number of stitches, passed through the skin alone, or the skin and muscles, avoiding the peritoneum. Adhesive plaisters are to be placed carefully in the intervals, and a bandage with a soft compress being applied, the patient is to be laid to rest. An anodyne should be given to diminish the shock to the system."*—*Burns' Principles.*

At what stage of the labour would you perform the operation?

785. "It has been proposed by Doctor Hull to operate as soon as the os uteri is dilated, and before the membranes burst, in order that the wound of the uterus may contract, into a smaller size." And I should say, that the success of the operation will very much depend on this rule being observed.

Is there no other emergency that would require the performance of this operation for the sake of the child alone?

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* On the Continent, this operation has been followed by considerable success; and, for two favourable instances, see Med. Chir. Trans. vol. ix. p. 11, and vol. xi. p. 201. The first was performed by Dr. Locher of Zurich, and the second by Dr. Nicholas Meyer of Minden. The first patient died in a subsequent pregnancy, under a repetition of the operation.

786. " When the mother dies in the end of pregnancy, and there is reason to think that the child is alive, there is an imperative call to perform the operation. The uterus may live longer than the body, and after the mother has been quite dead, the child still continues its functions. An instance is lately related of Dr. Ebel, where the uterus expelled a child after the interment of the mother, and the fact was discovered by raising the body for examination owing to a suspicion of murder."—*Ibid.*

" A woman died of dysentery, of two months' duration, in the end of pregnancy, and, by the operation performed about twelve minutes after death, a living child was extracted." *—*Ibid.*

Var. 5.—*Ab obstructionibus in transitu.* From obstructions in the passage.

What is the nature of the obstructions here alluded to?

787. The progress of the child through the cavity of the pelvis may be impeded by tumours,† stone in the bladder, retention of urine, hernia, enlarged ovarium, &c.

State the kinds of tumours, that may obstruct the progress of the labour?

788. Tumours may consist of ossifications from the bones of the pelvis, of steotomatous, scirrhous, or polypous growths, or of encysted swellings.

Should the labour be retarded by a cause of this kind, how would you treat the case?

789. This must entirely depend on the size and character of the tumour. Should it be moveable and pendulous, it should be held out of the way of the presentation, till the latter has entered the pelvis; should it be decidedly encysted, and contain a fluid, it ought to be punctured by a trocar to lessen its volume; again, should it not admit of either of the above modes of treatment, we shall be called upon to deliver with the

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* This operation was performed in St. Thomas' Hospital, by Mr. Green, on a poor woman, who had been killed by being run over by a heavily-laden coach. The child was still born; but life was restored by the means that were adopted, and prolonged thirty-four hours.

† See two very interesting papers on this subject, in the Med. Chir. Trans· one by Mr. Park of Liverpool, in vol. ii. p. 298, and another by Dr. Merriman, vol. x. p. 50.

forceps, if the child shall have descended low enough to admit of their use; but should we be reduced to the choice of the crotchet or excision, the latter, under circumstances favourable to the removal of the tumour, may be preferred.*

What circumstances would you consider as unfavourable to excision?

790. "Extirpation cannot in any mode be proposed, if firm cohesions have been contracted between the tumour, vagina, and rectum."—*Burns' Principles.*

What treatment would you adopt, should the labour be impeded by stone in the bladder?

791. We should endeavour to keep the stone above the pubes, by the fingers, till the head has fallen into the cavity of the pelvis, after which, it can no longer be an impediment; but should this be impracticable, the stone should be extracted either by dilatation of the urethra, or by incision.†

How would you ascertain that parturition was impeded by an over-distension of the bladder?

792. This may be discovered by an examination of the pubic region and vagina; and proved by the introduction of the catheter.

What diagnostic marks would enable you to distinguish a vaginal hernia; and, if present, how would you prevent it impeding the progress of the labour?

793. It may sometimes be extremely difficult to distinguish a hernia of this kind from an encysted tumour; and yet it would be of vital importance with reference to the treatment. A hernia may be detected by its being reducible; by its communicating to the finger an impulse, when the patient coughs; by the gurgitating feel peculiar to hernia; and by a sense of sickness being produced by making strong pressure upon the tumour.

The only mode of treatment that could be adopted would be to return the protrusion into the belly, and to prevent its descent, till the presentation has passed the hernial orifice, in the best manner we can.

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* For a successful example of this mode of treatment, see a most interesting case that occurred to Mr. Burns, and related by him in his Work, p. 37. See also a less fortunate case of the same kind, which occurred to Doctor Denman, and which did not admit of excision.—*Denman's Introduction to Midwifery.*

† Much has been said on the subject of a stone in the bladder becoming an impediment to labour; but I cannot find any case of the kind on record; nor, indeed, is it likely that such a case will occur, as the symptoms would be naturally complained of and remedied before the full period of utero-gestation. See a very practical paper on the mode of dilating the female urethra, in the Med. Chir. Trans. vol xii. p. 235.

Again. Suppose the vagina were obstructed by an enlarged fluid ovarian cyst, what are the tests, by which you would ascertain its real nature; and what would be your treatment?

794. A fluid ovarian cyst could be detected by its fluctuation and size. The principal case, with which it may be confounded, is a retention of urine; but it may be distinguished from this by passing the hand into the vagina and tracing its position, or more certainly by the use of the catheter. As soon as we are convinced of the real nature of the case, the fluid ought to be evacuated by a trocar.*

VAR. 6.—*A cicatricibus vaginæ.* From cicatrices of the vagina.

It sometimes occurs to the practitioner to find a labour obstructed by cicatrices or adhesions of the vagina. What would be your treatment under such circumstances?

795. "Of course, when labour comes on, the gravid uterus would be impelled against the adhering part, which would either separate or resist the exclusion of the child. In the former case, nothing would be required to be done by art; but in the latter, it would be necessary to divide the united parts by an incision made with great care, and only to a certain degree, leaving the full separation to be made by the membranes, containing the waters, or by the head of the child, which will then effectually answer the purpose in a better way than any more extended operation."—*Denman's Introduction.*

VAR. 7.—*A fune umbilicali brevi.* From extreme shortness of the funis umbilicalis.

Might not the umbilical cord, either being naturally extremely short, or shortened by being coiled around the neck of the child, become the cause of impeded parturition?

796. This cause may certainly impede the progress of a labour for a while, but it seldom prevents the ultimate delivery

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* Denman mentions two cases of ovarian impediment; one of which died from the use of the crotchet. In the other, the cyst was punctured, and the woman was delivered naturally.

Doctor Merriman has recorded another case in the third volume of the Medico-Chirurgical Transactions, page 47.

of the child. "By patience the labour shall be safely terminated; but it may be accelerated by keeping the person for some time in an erect posture on the knees.—*Burns' Principles.*

Should you find, on the birth of the head, that the cord had been so coiled around the neck, as not only to have impeded the labour, but to endanger the life of the child, how would you instantly relieve the child?

797. By passing a double ligature around the cord, and dividing the intermediate space.

Var. 8.—*A malâ positione uteri.* From malposition of the uterus.

What measures would you take, should you find that parturition were prevented by a retroversion of the womb?

798. This is a circumstance seldom met with at the advanced periods of utero-gestation; but such a state of things would present a difficulty, which could "only be remedied by cautiously attempting to press down the os uteri from above the pelvis." Should we fail in this attempt, the labour would be both "tedious and severe."—*Burns' Principles.*

May the uterus be placed in any other position that would impede delivery?

799. "A great degree of obliquity of the uterus protracts labour. The os uteri may be turned very much to one side; but oftener it is directed backwards and upwards, and may be out of the reach of the finger."—*Ibid.*

Could any thing be done to expedite the delivery in this case?

800. "Time rectifies this; but much time and pain may be spared, by gently pressing the os uteri forward with the finger."—*Ibid.*

Var. 9.—*Malpositio fœtûs.* Malposition of the child.

Does not a malposition of the child frequently become the cause of interruption and resistance to the progress of labour?

801. In most malpositions of the child, the nice proportions between the sizes of the different parts of the child and the corresponding dimensions of the pelvis being disar-

ranged, such malpositions become the cause of resistance to labour.

BREECH PRESENTATION.

Is there any presentation of the breech that can impede labour and require our interference?

802. "The established practice now is, when the pelvis is well formed, and other circumstances do not require speedy delivery, to allow the breech to be expelled without any interference until it has passed the external parts."—"And should we then find that the belly of the child lies towards the groin, we shall be called upon "to grasp the breech, and slowly endeavour to turn the body round; but should this not succeed, or not have been attempted till the shoulders have come down and the head is about to pass the brim, the practice is dangerous, and the neck may be materially injured. It is, in this case, better to introduce a finger, and press with it on the head itself, endeavouring thus to turn the chin from the acetabulum to the sacro-iliac junction of the same side. If the position be not rectified, then we assist the descent by depressing the chin and gently bringing it under the pubes; and this may be facilitated by pressing the vertex upward and backward, and making it turn up on the curve of the sacrum, to favour the descent of the face."—*Ibid.*

What reasons have you for changing the position of the child in this manner?

803. Two; first, because the head will pass more readily through the outlet with its vertex towards the pubes; and, secondly, because the life of the child will be less endangered by pressure on the umbilical cord.

In what position would you place the body of the child, as the head is passing under the arch of the pubes?

804. The body of the child must be carried forward by the right hand towards the thighs of the mother, in order that the occiput may be raised upon the inferior angle of the pubes, and during this, the left hand should be employed in supporting the perinæum, which in this case will be found very much upon the stretch.

Is not the life of the child endangered in presentations of the breech?

805. "This will depend on the progress of the labour, and, therefore, after the breech is expelled, should the process be slow, the delivery of the body and head must be carefully

accelerated, lest the umbilical cord suffer fatal compression."—*Ibid.*

"The first symptom of danger is a convulsive jerk of the body; and if the head be not speedily brought down, the child will be lost. Should delay inevitably arise, we must try to bring the cord to the widest part of the pelvis. But even though all pressure could be removed, the child cannot live long, if it be not delivered, as the function of the placenta is soon destroyed, that organ being often entirely detached from the womb, and following the head as soon as it is born."—*Ibid.*

What treatment would you adopt, should you have a deformed pelvis along with this presentation?

806. "When the pelvis is contracted or deformed, it will be prudent, at an early stage of the labour, to bring down the feet; but if this have been neglected, then, should the difficulty of delivery, or the length of time to which the labour is protracted require it, some insinuate a blunt hook on a soft ribband over one of the groins, and thus extract the breech; but the forceps may be applied with much more advantage. When the resistance is slight, the insinuation of the fingers over the groin may sometimes enable us to use such extracting force as at least excites the uterus more briskly to expel. Should the head not easily follow the body, we must not attempt to extract it by pulling forcibly at the shoulders, as we may thus tear the neck and leave the head in utero. The cord is first of all to be freed as much as possible from compression; then we gently depress the shoulders in the direction of the axis of the brim, at the same time that we, with a finger, act upon the chin. Should this not succeed, we must apply the lever over the head, and depress it in the proper direction.* If this fail, the only resource is to open the cranium above or behind the ear, and fix a hook in the aperture; but this is not to be done until we have fully tried other means, and by that time the child will be dead."—*Ibid.*

Are not the genital organs of the child frequently injured by this presentation, where the labour is tedious; and what would be your mode of treatment of them?

807. The organs of generation not unfrequently suffer from this cause, and are considerably endangered by the con-

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* The lever, under such circumstances, where the deformity is but slight, will be found a useful instrument, and similar advantage may be derived from one blade of the forceps, should no other lever be at hand.

sequent inflammation. The best applications are spiritous fomentations.

PRESENTATION OF THE LOWER EXTREMITIES.

In what manner would you conduct a presentation of the lower extremities?

808. The management is the same as in presentations of the breech, taking care, as the child advances, that the breech be turned towards the range of the pubes.

Is it not possible that two feet presenting may be the feet of twins?

809. It is possible; and therefore "it is proper to ascertain that the feet be right and left."—*Burns.*

Should three feet present in the vagina, what course would you pursue?

810. In such a case, I should ascertain as soon as possible whether the child were grown double, or whether it was a twin case; if the former, I should treat it as a breech case; if the latter, I should push up or retard one child, whilst I brought down the other.*

PRESENTATION OF THE UPPER EXTREMITIES.

How would you distinguish a presentation of a hand from that of a foot?

811. The hand may be distinguished by its flatness, by the thumb, and the length of the fingers. The foot, by its length, by the heel, by the shortness of the toes, and the want of a thumb.

How would you distinguish the shoulder from the breech?

812. In the former "the shape of the scapula, the ribs, the sharpness of the shoulder joint, and the direction of the humerus, together with our often feeling, in an examination, either the hand or neck, will be distinguishing marks. In the latter, the round shape and great firmness of the ischia, the size of the thigh, its direction upwards, and its lying in contact with the soft belly, the spine of the ilium, *the parts of generation*, the size of the tuberosity of the ischium, and the

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* Mr. Ainge, of Fareham, met with an instance of this kind at the full time of gestation. Three feet presented; and, in so novel a case, he requested a consultation. The labour was not interfered with, and a double child was born without difficulty.

general shape of the back part of the pelvis, contribute with certainty to ascertain the nature of the case."—*Burns' Principles.*

State the varieties of presentation of the upper extremities.

813. "The hand and arm may present under different circumstances. The original presentation may have been that of the shoulder; but the arm may have, in the course of the labour, been expelled; or the hand may rest on the os uteri, before the membranes have broken; or the fore-arm may, for a length of time, lie across the os uteri, the hand not being protruded for some hours. Sometimes both hands are felt at the os uteri, and even both arms may be expelled into the vagina; but in most cases this does not happen, unless an improper conduct be pursued. In some rare instances, the hands of twins have been found presenting together, both sets of membranes having given way; it is more common to find both the hands and feet of the same child presenting."—*Ibid.* In this case the cord may present at the same time.

In presentations of the upper extremities, at what part of the uterus will the feet usually be found?

814. In the fore part of the uterus, towards the navel of the mother.

Is there any method of proving *their position?*

815. "Their position may be known by examining the presentation. If we feel the shoulder, we know that if the scapula be felt toward the sacrum, the feet will be found towards the belly. If the arm be protruded into the vagina, the palm of the hand is found in supination, directed toward the side where the feet lie."—*Ibid.*

In presentations of the upper extremities, can a child be expelled by the natural efforts, without the assistance of art?

816. Many cases are recorded, particularly by Dr. Denman, where, by strong and continued efforts, a spontaneous evolution has taken place, and the child has been expelled with the breech presenting.

Do you consider that the knowledge of such a fact would justify your leaving presentations of the upper extremities to the efforts of nature, without interposing the assistance of art?

817. A knowledge of this would by no means justify our dependance on the powers of nature; for although many children, probably, would ultimately be born in the manner just stated, yet it is to be feared that more would be undelivered.

What is the treatment of presentations of the upper extremities?

818. "To turn the child, and to deliver by the feet. In the performance of the operation, we should be careful in all cases not to rupture the membranes prematurely; and more effectually to preserve them entire, we must prevent exertion or much motion on the part of the mother. As soon as the os uteri is soft, and easily dilatable, the hand should be introduced slowly into the vagina, the os uteri gently dilated, and the membranes ruptured. The hand is then to be immediately carried into the uterus upwards until the feet be found. Both feet are to be grasped betwixt our fingers, and brought down into the vagina, taking care that the toes be turned to the back of the mother."—*Ibid.* The remaining steps have been already described.—*Vide* 802 *and following.*

Is not this operation extremely painful and hazardous to the patient?

819. This will, for the most part, depend on the caution and skill of the operator. A cautious and gentle proceeding, supposing that the operation is undertaken before the rupture of the membranes, will neither give much pain nor be in the slightest degree hazardous to the mother; but a precipitate and rude mode of turning a child in utero will be replete both of pain and hazard.

Should you ascertain that the upper extremity presents before the os uteri is much dilated, and before the membranes are broken, what is the proper time for commencing the operation?

820. "We are not to attempt the introduction of the hand whilst the os uteri is hard and undilated; this is an axiom in practice: on the other hand, we are not to delay until the os uteri be dilated so much, as to be apparently sufficient for the passage of a bulky body. In the cases now under consideration, the os uteri does not dilate so regularly and to so great a degree before the membranes break, as when the head presents. If we wait in this expectation, the membranes will give way, before we be aware. If the os uteri be dilated to the size of half-a-crown, thin and lax, the delivery ought not to be delayed, for every pain endangers the rupture of the membranes. If they do give way, we are immediately to introduce the hand, and shall still find the operation easy; for the whole of the water is not discharged at once, nor does the uterus immediately embrace the child closely. If the liquor amnii have been discharged in considerable quantity previous to labour, or if the membranes have burst at the commencement of it, when the os uteri is firm and small, we must, by a recumbent pos-

ture, try still to preserve a portion of the waters till the orifice will permit delivery."—*Ibid.*

When you are called to a case of this kind, where the waters have been long evacuated, and the uterus is, from great exertion, closely contracted around the bulk of the child, what steps would you take before you made any attempts to turn the child?

821. "This is a very troublesome case, and requires great caution. If the pains be frequent, and the contraction strong, then all attempts to introduce the hand, and turn the child, must not only produce great agony, but, if obstinately persisted in, may tear the uterus from the vagina, or lacerate its cervix or body. After a delay of some hours, however, the uterus may be less violent in its action; but it is better at once to moderate it by art. Copious blood-letting certainly has a power in many cases of rendering turning easy; but it impairs the strength, and often retards recovery. If the patient be restless and feverish, it may to a certain extent be necessary and proper; but if not, we shall generally succeed by giving a powerful dose of tincture of opium, not less than sixty or eighty drops. Previous to this the bladder is to be emptied, lest it should be ruptured during the operation; and, if necessary, a glyster is to be administered. The patient is then to be left, if possible, to rest."—*Ibid.*

This being done, when would you proceed to turn?

822. "Sometimes in half an hour, but almost always within two hours after the anodyne has been taken, the pains become so far suspended, as to render the operation safe and perhaps easy."—*Ibid.*

In what manner would you perform the operation?

823. "Our first object is to get the hand into the uterus; and for this purpose we must raise up the shoulder a little, working the fingers past it, by slow, cautious, but steady efforts. The cervix often contracts spasmodically round the presentation, and is the chief obstacle to the delivery; but the opiate generally allays this, and we are not to be in too great a hurry to overcome this. We must wait the efforts of the anodyne, and are never to use force or violence. I believe that slow efforts after the use of opium will always prove successful. Sometimes our efforts renew the pains, which, although they may not prevent the operation, make it more painful, and cramp and benumb the hand. Having passed the hand beyond the cervix, we carry it on betwixt the body of the child and the surface of the uterus, which is felt hard and smooth, from the tonic or permanent action of the fibres, until we reach the feet,

both of which, if possible, we seize and bring down; but if we cannot easily find both, one is to be brought down into the vagina and retained there. The child will be born with the other folded up on the belly. In bringing down the feet, as well as in carrying up the hand, we must not act during a pain, but should keep the hand flat on the child; a contrary practice is apt to lacerate the uterus.''—*Ibid.*

Should you find the arm protruding from the external part, and the shoulder forced down into the vagina, would you endeavour to return it before you attempted to turn the child?

824. " So far from it being necessary to replace the arm, we shall sometimes find advantage from taking hold of it with one hand, whilst we introduce the other along it, as the parts are thus a little stretched, and it serves as a director by which we slip into the uterus."—*Ibid.*

If turning the child be found absolutely impracticable, what course would you pursue?

825. In this case, the child should be delivered by the blunt hook or crotchet; and this in general may be done, by carrying the finger between the perineum and the child, to guard the soft parts of the mother, and then, by cautiously introducing the perforator upon the finger, and piercing the abdomen, in order that the hook may be fixed on the pelvis.—*Ibid.*

But would you not rather wait for the spontaneous evolution before you resorted to such means?

826. If the pains should remain extremely strong, and be found to influence, however gradually, the position of the child, we ought to wait a reasonable time for the result of the uterine efforts; but if the woman have been long in labour without having produced any change in the presentation, and especially if she appear to be worn out by her exertions, I should immediately proceed to deliver the child by the above means, using the greatest caution in the operation.*

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* The earliest period of pregnancy, in which I have found the presentation of the upper extremity to obstruct the progress of labour, was about the fifth month. This occurred to a poor woman moribund in consumption of the lungs. She supposed herself to be pregnant, and fell into premature labour at the above-mentioned period. Having been in regular and severe pain for forty-eight hours, without any advance on the part of the fœtus, I was desired to visit her. On making a common examination, I found the arm presenting. This explained the delay, and the least exertion of the fore-finger, acting as a hook on the body of the child, brought down the feet. Had the woman been in health, it is probable that there would have been no difficulty or delay in the natural expulsion of the child.

PRESENTATION OF THE BACK, BELLY, BREAST, OR SIDES.

In presentations of the back or belly of the child, what steps would you take?

827. If the child lie transversely, and remain a long time in the same position, we should introduce the hand and deliver by the feet.*

MALPOSITION OF THE HEAD.

What is the natural and standard presentation of the head?

828. When the vertex or hind-head is inclined towards the range of the pubes.

State the principal malpositions of the head, as they are most commonly found in practice.

829. Presentations, where the face is turned towards the pubes, and presentations of the face.

What would lead you to suspect a malposition, in which the face was turned towards the pubes?

830. An unusual delay in the labour, without any obvious cause.

How would you detect the fact?

831. By a careful examination of the presentation, by which we shall discover either the anterior fontanelle, the orbitar margins, or other marks of the forehead towards the pubes.

By what marks would you distinguish the anterior fontanelle?

832. The anterior fontanelle may be distinguished by its size, and by the crossing of the coronal and sagittal sutures, almost at right angles; whereas, the posterior is much smaller; and in this, the sagittal does not cross the lambdoidal, but terminates in it.

Ought you not in every labour, even when you know that the head presents, to possess yourself of the exact presentation?

833. It becomes every practitioner to do this as soon as he conveniently can, without occasioning unnecessary pain; especially should there be any unusual delay in the progress of the labour.

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* I was called to assist a woman in her labour, that was rendered difficult from a presentation of the middle of the back. The child was born immediately before my arrival. That the presentation was of this kind there could be no doubt, as it was plainly indicated by a large, discoloured and œdematous swelling of the back; but whether the child was born in the same doubled position, I had not an opportunity of observing. The probability is, that it was so.

Should you find the forehead inclined towards the pubes, what mode of treatment would you pursue?

834. I should introduce two fingers, and, by making pressure on that part of the coronal suture, which is near the pubes, turn the head round, till the vertex be brought into its natural position, that is, towards the range of the pubes.

Is this an easy operation?

835. It is extremely easy, and may be accomplished at one sweep of the fingers, if it be performed before the head has descended into the cavity of the pelvis; but, in the latter position, there is greater difficulty in the operation.

How would you accomplish it in the latter case?

836. " By pressing steadily, during a pain, against the parietal bone," till the position of the head be changed.*

Should you find it impracticable to accomplish a change in the position of the head, what would be your conduct?

837. " We are to wait a longer time for the effect of the natural pains; experience having proved, that the head in this position may be, and almost universally is, ultimately expelled without the assistance of art."—*Denman's Introduction.* But, should the uterine efforts prove unequal to the expulsion, we are to use the forceps or the crotchet, or such means as the nature of the case shall require.

How would you discover a presentation of the face?

838. "The presentation of the face is discovered by the general inequalities of the presenting part, or by the distinction of the particular parts, as the eyes, the nose, mouth, or chin, which is usually, if not always, inclined towards the pubes."—*Ibid.*

Would you be called upon to interfere with this presentation?

839. By no means; for, " in this presentation, the child will generally be expelled by the natural efforts; although a

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* This is an operation, which every accoucheur ought to know when and how to perform; for as the knowledge of it may often bestow on his skill the praise and confidence of his patient, so the being ignorant of it might throw the meed into the scale of another, who may be called in consultation.

Case.—A gentleman, having been a considerable time in attendance on a lady in her labour, which had been considerably delayed by a malposition of the head, and having some urgent business to perform, requested his partner to supply his place during his absence. He returned in a very short time, and, to his surprise, found the delivery completed. Upon enquiry as to the cause of so speedy a change, he learned that, which he never afterwards forgot—the mode of turning the head in the manner above described.

much greater length of time will be required for the completion of the labour, especially with first children. But the child may be, and generally is, born without any injury, though the face will sometimes be swelled in an astonishing manner, and the external parts of the mother, being infinitely more distended than in a natural position, greater care is necessary to prevent their laceration."—*Ibid.* If, however, the mother be found unequal to the expulsion, instrumental aid must be administered according to the situation of the child.

Again, suppose the head present with one or both arms, what steps would you take?

840. "Though the head should present with one or both arms, experience hath fully proved that a woman may be delivered with the natural efforts with safety to herself, and without prejudice to her child, if the pelvis be well formed;"—and, therefore, in such a case he ought not to interfere; but in a pelvis of small dimensions, such a presentation may become the cause of a retarded or difficult labour; and, in order to prevent the difficulty, the practitioner, in the beginning or in the course of a labour, ought to endeavour to return and detain the presenting arm or arms beyond the head. At all events, he must "be very careful not to solicit the descent ot the arm before the head, lest he should change the whole situation of the child, and convert that which would have been only a variety of a natural into a preternatural labour."—*Ibid.*

Should it so happen that along with the head a foot and an arm should present at the same time, what would be your conduct?

841. "It will then be expedient to grasp and bring down the foot, and to deliver in that manner. But it behoveth us to distinguish very cautiously between a hand and a foot, because the mistake would lead us to the necessity of turning the child, an operation which would otherwise not have been required."—*Ibid.*

In the above malpositions and varieties in the presentation of the head, should there be an occasion for the application of the forceps, in what manner ought they to be applied?

842. "Should such necessity exist with this position of the head, the forceps are to be applied in the manner before described, over the ears of the child. But when they are applied, we must act with them with the greatest caution; for having a different and less perfect hold of the head, they are apt to slip, and acting with less advantage, the operation, in this position of the head, must be more precarious."—*Ibid.* And should it

be necessary to apply them in a case of presentation of the head with one or both arms, their application and action must be the same as if the arms had not presented.

Is not the perinæum in the greatest possible danger in these cases—for example, whilst a malposition of the head, accompanied with both arms, is clearing the arch of the pubes, under the action of the forceps?

843. Most undoubtedly; and at such a moment our best attention and our greatest care are indispensably necessary to prevent laceration.

SPECIES 2.—*Partus debilis.* Weak parturition.

VAR. 1.—*A debilitate uteri.* From debility of the uterus.

Might not labour be sometimes interrupted by a want of power on the part of the constitution or the uterus itself?

844. Denman says, "I do not recollect one instance of any woman (taking consumption as a fair example of weakness of the constitution), in this situation, being unequal to her delivery."* It, however, sometimes, though rarely happens, that a labour is apparently interrupted or rendered very lingering by a want of power on the part of the uterus.

How would you distinguish such a labour from that, rendered tedious by rigidity?

845. The former may be distinguished by the insufficiency, tardiness, or irregularity, of the pains during the process of labour; whilst, in the latter, the uterine efforts are natural, strong, and regular.

Would you feel yourself justified in expediting the labour in such a case?

846. "If the protraction of the delivery be the only inconvenience which the patient suffers, and if there are no convulsions, no flooding, nor well-marked signs of collapse, to excite alarm, it is scarcely necessary the accoucheur should interfere at all. The patient, however, ought to observe as much as possible the sitting posture; and, agreeably to her strength, occasionally to walk about the chamber; as such means are sometimes found to stimulate the uterine action. At the same time it will be useful to procure sleep by an opiate at bed-time."—*Blundell's Lectures. Lancet.*

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* My own experience corresponds with this assertion of Dr. Denman; indeed, I have usually found the labour rendered more easy to the patient, from the great relaxation of the soft parts.

Would you rupture the membranes in this case to accelerate the progress of the labour?

847. If there be positive proofs *of the presence of labour*, and if the pains shall have been very inert and insufficient, for a considerable time, the rupturing of the membranes will not only be justifiable, but probably very conducive to the delivery.

If the uterus remain equally inert after the rupturing of the membranes, and the full dilatation of its orifice, are there not means that could be used to expedite the labour?

848. In the first place we ought to try the gentlest means.—We may give a cordial occasionally, such as a a little wine and water, or eight or ten drops of laudanum; which dose, sometimes, has the effect of exciting uterine action; or, as some have advised, we may make pressure with the finger along the posterior part of the vagina.

Should these gentle means fail to excite the uterus to action, what other measures would you adopt?

849. If the head be sufficiently low, we may apply the forceps, the mere introduction of which will frequently be sufficient to bring on strong and adequate pains; or we may give the secale cornutum, or ergot of rye.

Do you consider this a case, to which the ergot of rye is adapted?

850. I consider this the only case that properly indicates the use of the ergot—viz. where, from no obvious cause, little or no uterine action is exerted for the expulsion of the child; where the first stage of labour is nearly completed, and where there is no resistance to be overcome.

In what form and dose would you administer this medicine?

851. According to Doctor Blundell, a drachm of the secale cornutum should be added to three ounces of boiling water, and reduced by boiling to an ounce and a half; of this a tablespoonful may be given every twenty minutes, till the uterine action is produced.

According to Mr. Burns, a scruple of the powder may be given every quarter of an hour, to three doses.

Should the head be in a situation to allow of the application of the forceps, would you not use that instrument in preference to the administering of the ergot?

852. I should say that, in every case of this kind, admitting its application, the forceps ought to be preferred.*

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* I am fully aware that, by this reply, I have almost excluded the use of this celebrated nostrum, as a remedy in lingering parturition, from the

Is not the ergot frequently the cause of the death of the child?

853. It is difficult to account for the death of the child from any specific quality of this medicine; but that it is followed

field of obstetric practice. I do not, however, object to its use on the ground of its inefficacy—on the contrary, from the testimony of a variety of practitioners, it is a medicine that sometimes acts specifically on the muscular action of the uterus, and frequently with vehement and uncontrollable power. Doctor Blundell supports me in thus limiting its use; and I know of no man, whose authority can be more suitably quoted on this subject. He says, "On some parts of the Continent there has, I believe, long been an opinion, that rye-bread is of abortive nature; and after all that I have seen and heard respecting the action of the secale cornutum, I think there is no doubt that it enjoys a specific power of stimulating the uterus, provided its muscular irritability be in a state well fitted to receive the impression. The secale cornutum, it is asserted, may kill the child in some cases; and if this were really the fact, it would be quite sufficient, in most instances, to set the remedy aside altogether, in cases of lingering parturition; for, as in general there is no danger in delivery of this kind, if committed to itself, of course the life of the fœtus must not be put to risk. I ought, however, to state here, that I am by no means satisfied that the secale really does exert a poisonous influence on the child, though I am by no means prepared to deny it. The secale cornutum is likely enough to destroy the fœtus, if you use it, not in the lingering cases which we are now considering, but where the birth is delayed in consequence of increased resistance, rigidity, narrowings, or the unfavourable position of the head. In cases like these, if the secale cornutum be exhibited, and have a very lively effect, it may force the child down among the bones of the pelvis, where it may die by compression; not to mention that, under the circumstances stated, there must be no small risk of rupturing the uterus. In these cases, then, in which the resistance to the uterine efforts is great or insuperable, the secale cornutum may endanger both the mother and her offspring; but, in lingering labours, assuming that the rye exerts no direct and poisonous effects, I look upon it as a very valuable and efficient remedy, at least in some instances. It should be observed, however, that the ergot of rye is of very uncertain operation; sometimes to appearance exciting the uterus most vehemently, while at other times it scarcely acts at all; nor is the cause of this difference altogether intelligible."—*Blundell's Lectures.—Lancet.*

Now, it appears from the above citation, that Dr. Blundell considers the ergot a very dangerous remedy, when administered in cases of labour rendered tedious by resistance; and very properly therefore limits its use to such cases as are lingering from a want of uterine action, and where there is no resistance to be overcome. To the caution given by Doctor Blundell I feel justified in adding that, even in lingering cases, it ought only to be given, where the os uteri is almost wholly dilated, and where the head is above the reach of the forceps—an instrument, *when cautiously* used, perfectly void of danger either to the mother or child. If this then be the only case of lingering labour, in which the ergot ought to be administered, how comes it, that we so frequently hear of its adhibition? The reason is obvious—because it has been given indiscriminately in cases rendered tedious either by a small pelvis or by frequently by this effect Doctor Blundell is not prepared to deny.—*See note to* 852.

Mr. Burns also is "rather disposed to believe the assertion that given prematurely it is fatal to the child."

Var. 2.—*A scissurâ uteri.* From rupture of the uterus.

Is there no other cause of a want of uterine power?

854. Yes—a rupture of the uterus itself.

In what manner does this circumstance usually take place?

855. "The uterus may be ruptured by attempts rashly made to turn the child; or, after the water has been long

resistance of the soft parts. But it may be said that, admitting this to be true, such evidence is in favour of the ergot, and proves that it may be advantageously given in such cases. On this, however, it will be impossible to decide, till we have heard the "alteram partem;" till its untoward effects have been published, as well as its success: but these, I fear, are seldom permitted to see the light, because they could not bear it.

During the trial of any new remedy, it is most desirable that the evil as well as the good resulting from it, should *be candidly recorded*, in order that a just conclusion may be drawn of its merits or otherwise. Were I asked what evils I expected to result from the ergot, given in cases not adapted to its use, I would say that the fundus of the uterus may be ruptured—its orifice may be torn—the perinæum or rectum may be lacerated—the bladder or urethra contused, and, lastly, that uterine or peritoneal inflammation may be produced. Sloughing of the bladder and inflammation of the uterus I have myself seen to result from the abuse of this remedy; at least, the maladies occurred in cases in which the ergot of rye had been given—and as the former labours, in these patients, had not been attended with such effects (the remedy not having been administered to them), it is just to attribute the consequences to the abuse of this medicine.

As a further proof of the danger of giving the ergot to overcome resistance, I shall quote the words of a patient herself upon the subject—a lady whose pelvis is small, and who was always delivered by the forceps, till her last confinement, when the labour was effected by the influence of the ergot.—"I have ever been compelled to submit to the use of instruments for the delivery of all my children excepting the last, which was expelled by the forcing efficacy of a powder, taken in three doses; but were I again to be under the necessity of choosing this medicine or the use of instruments, I would infinitely rather be subjected to the latter, than again suffer the dreadful sensations produced by the powder, the effects of which I shall never forget."

Let me then advise the young practitioner, who may be apt to place full reliance on the efficacy of new remedies, not to contract the evil habit of carrying about him doses of the ergot, whenever he is called to a labour; and never to administer the medicine but to such cases, as may in the strictest sense require its use—(cases which, I repeat, must be extremely rare)—lest he convert (what he believes to be) a remedy into a bane of the worst kind.

evacuated, some projecting part of the child may so affect a portion of the uterus, as to make it tear. A certain set of fibres may also be suddenly and spasmodically contracted, and laceration may thus take place."—*Burns' Principles.*

The uterus may also be ruptured by external violence.

Are there any indications by which the spontaneous rupture may be foreseen and averted?

856. "Such indications are for the most part obscure; but we are led to anticipate laceration, when the patient is restless, and complains of severe local pain, subject to great exacerbation, and attended with very acute and tearing sensation. The pains are violent and frequent, and usually do not produce a great effect on the os uteri, which is often very rigid. These symptoms are still more alarming, if the liqour amnii have been fully evacuated."

It is, however, extremely difficult to prognosticate such an event; "for in these cases there is often very little warning, and the accident may happen, when we are just in expectation of a happy delivery."—*Ibid.*

Should you, from the above-mentioned symptoms, connected with other alarming circumstances, have just reason to apprehend a rupture, what course would you pursue?

857. "The treatment to be followed must depend on the apparent cause; rigidity is to be overcome by venesection; spasmodic action by an opiate glyster; change of structure of the os uteri may demand consideration, how far incision may be proper;* malposition of the child must be rectified; and, finally, when the pelvis is contracted, and there is any symptom indicating the risk of laceration taking place, the forceps are instantly to be employed; or, when such symptoms exist in any case, where the foreeps are applicable, it would be criminal to delay."

What are the proofs that the accident has really happened?

858. "The woman feels something give way within her, and usually suffers at that time an increase of the pain. The presentation disappears more or less speedily, unless the head have fully entered the pelvis, or the uterus contract spasmodically on part of the child. The pains go off as soon as the child passes through the rent into the abdomen; or if the presentation be fixed in the pelvis, they become irregular, and gradually decline. The passage of the child into the abdominal

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* In this I cannot concur with Mr. Burns, as such an operation would inflict the very wound we wish to prevent.

cavity is attended with a sensation of strong motion of the belly, and is sometimes productive of convulsions. The shape of the child can be felt pretty distinctly through the abdominal coverings.

"The patient, after this accident, soon begins to vomit a dark-coloured fluid;* the countenance becomes ghastly; the pulse small and feeble; the breathing is oppressed, and frequently the patient cannot lie down. Sometimes the intestine protrudes through the wound in the uterus, and has even been strangulated by it."—*Ibid.*

What treatment would you instantly adopt in such a distressing case?

859. The woman ought immediately to be delivered; and the mode of delivery must ever depend on the situation of the child. If, as is usually the case, the child has passed through the rent into the cavity of the abdomen, we must follow it and deliver by the feet; and after the extraction of the placenta, we are to satisfy ourselves that no portion of the omentum or intestine is strangulated by the contraction of the aperture.

Is it always practical to pass the hand through the rupture of the uterus?

860. The practicability of doing this will very much depend on the degree of uterine contraction, that has taken place. This will be found most easily done, when the rent is in the cervix uteri or vagina; when it is higher, there may be much greater difficulty, owing to the contraction of the uterus—especially if the rupture has taken place some time.—*Ibid.*

Should you find the uterus very much contracted, would you persist in endeavouring to accomplish the delivery through the rent?

861. "It would be both cruel and useless to attempt delivery in such a case."—*Burns' Principles.*

Supposing that either from the os uteri being very little dilated, from the contraction of the uterus, a very small pelvis, or any other cause, you should deem delivery per vaginam

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* This fluid is probably analogous with that, which the stomach ejects when the bladder bursts into the peritoneal cavity of the belly; and which, in the case recorded in this work, took place very soon after the rupture, vide note, page 161. It is remarkable, that the fluid should be so speedily and copiously formed. Does it spring from the secreting vessels of the liver, stomach, or intestines, or from the simultaneous action of all? From whatever source, it is manifestly the product of morbid and vehement sympathy.

impracticable or unjustifiable, what other mode of delivery would you adopt?

862. "In such circumstances we must either perform the Cæsarian operation (vide 784) or leave the case to nature. If we have been called early, when the child is yet alive, and before the viscera have been much irritated by the presence of the fœtus, we are warranted to extract the child by a small incision. If many hours, however, have elapsed, then such irritation is often produced as renders it doubtful if the additional injury of the operation could be sustained."*—*Ibid.*

GENUS 5.—*Syncope.* Syncope.

What would be your treatment of syncope at an advanced period of utero-gestation or during labour?

863. "A simple paroxysm of fainting, unless it proceed from causes which would otherwise incline us to deliver, such as tedious labour, flooding, &c., is not to be considered as a reason for delivering the woman. We are to employ the usual remedies, and particularly keep the woman in a recumbent posture. Ammoniated tincture of valerian, or tincture of opium, are useful. But if the paroxysms be repeated, whatever their cause may be, we ought to deliver the woman if the state of the os uteri will permit. We must be very careful to prevent hemorrhage after the expulsion of the child, and this will be best effected by carrying a support around the abdomen."—*Burns' Principles.*

GENUS 6.—*Convulsio puerpera.* Puerperal convulsion.

How many kinds of the puerperal convulsion are there, and at what periods of gestation do they usually occur?

864. Two. The convulsion arising from plethora (which is by far the most common), and that arising from irritability, or weakness; and they occur, for the most part, either at the latter periods of gestation, immediately before, during, or after labour.

Are there any symptoms indicative of the approach of the puerperal convulsion from plethora?

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* Mr. Scott, surgeon, of Norwich, met with a most singular rupture of the uterus, by which the os uteri and part of the cervix were mechanically torn off by the force of the labour-pains.—*Medico-Chirurgical Transactions*, vol. xi. 392.

865. This disease is not unfrequently indicated in plethoric habits by a full countenance, by headach or giddiness, by interrupted vision, by difficult respiration, and by constipation of the bowels.*

How would you treat these symptoms, when they occur before labour?

866. The patient should be immediately and largely bled, briskly purged, and restricted to a vegetable and moderate diet.

Does not protracted labour very often conduce to this disease?

867. Tedious and strong labour very frequently excites the disease, by determining the blood to the head, which effect is very manifest during the exertion of a strong expelling pain.†

During a tedious labour, should the face of the woman become full and swollen from her exertions, would you take away blood upon the ground of preventing convulsions?

868. Not for these appearances alone, as they occur in most tedious labours; but if such appearances were accompanied with dimness of sight or giddiness, blood should be abstracted from the arm without delay.

State the symptoms of the puerperal convulsion from plethora.

869. The form of the puerperal convulsion is precisely the same as that of the epileptic.‡ "Convulsions may affect the patient suddenly and severely. She rises to go to stool, and falls down convulsed; or sitting in her chair, conversing with her attendants, her countenance suddenly alters, and she is seized with a fit; or she has been lying in a sleep, and the nurse is all at once alarmed by the shaking of the bed, and the strong agitation of the patient."

"The muscles are most violently convulsed; the whole frame shakes strongly, and the face is dreadfully distorted and often swollen. The tongue is much agitated, and is very apt to be greatly injured by the teeth; foam issues from the mouth;

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* Dr. Clarke, in his lectures, taught that the puerperal convulsion from plethora could generally be anticipated by these symptoms.

† Every prudent accoucheur will exhort his patient not to add more efforts to an expelling pain than are natural, and never desire her to stifle her cries with her pillow, but rather allow her to express her sufferings in as loud terms as she is disposed, and, indeed, compelled to utter. Loud vociferations may be distressing to the by-standers; but a constrained and unnatural silence is full of danger to the patient.

‡ The epileptic convulsion, here alluded to, is that, which occurs to advanced age, which is very terrible, and not unfrequently terminates in death or palsy.

and the convulsive inspiration often draws this in with a hissing noise; or she snores deeply, and cannot be roused during a fit.* The skin becomes, during the convulsion, livid or purple. The pulse during the whole of the disease is often slow, but sometimes it does at last become frequent, strong, and irregular."—*Burns' Principles.*

State the progress of the disease.

870. "This attack may end at once in fatal apoplexy; but generally the patient recovers, and is quite insensible of having been ill. There may be only one fit; and, without any interference, I have known the disease go off, and no return take place; but in general the attacks are repeated, and if they do not prove soon fatal, or are not averted by art, they recur with the regularity of labour pains, becoming more and more frequent, as they continue. The woman appears to have no labour pains, yet the os uteri is affected, and sometimes the child is expelled;† or if the patient become sensible in the intervals, and feel a pain coming on, it appears to be carried off by a supervening convulsion. The fit may last only a few seconds, or may continue with very little remission for half an hour. In some instances the patient is not sensible of bearing the child, and is afterwards long of recollecting her delivery." —*Ibid.*

What is the treatment of the puerperal convulsion from plethora?

871. "The first object is to prevent the patient from injuring the tongue, by inserting a piece of cork or wood into the mouth: this occupies no time. Next we bleed the patient, and must not spare the lancet. All our best practitioners are agreed in this, whatever their sentiments may be with regard to the nature of the disease or to other circumstances. We must bleed once and again, whether the convulsions occur during gestation or labour. There is more danger from taking too little blood than from copious evacuation. Often in a short time several pounds of blood have been taken away with ultimate advantage. Blood-letting also tends to relaxation of the os uteri. The quantity to be taken away must depend on the

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* The pupil of the eye in the puerperal convulsion is, sometimes, permanently contracted. This was manifested in a case, to which I was called in the year 1829.

† During the time of my writing on this subject, a case has occurred to Mr. Corfe, of this town, in which the child was found to have been expelled during the convulsions, although there was no appearance of the existence of labour pains. The woman recovered.

severity and obstinacy of the symptoms. We never ought to take away more than is required for relief; nor, on the other hand, are we to stop prematurely. It is desirable to procure the discharge as speedily, and in as full a stream, as possible; but it is not essential that it be taken from the jugular vein, nor is that often safe or practicable."

"Next we administer a smart glyster, which, if given early in the precursory stage, is of itself sometimes sufficient to arrest the progress of the disease. A smart dose of calomel or solution of salts may also be given with advantage, when the person can swallow; especially if the convulsions have occurred during pregnancy, with little tendency to labour. We must also attend to the bladder; that is to be emptied; for its distension alone has sometimes brought on convulsions."*—*Burns' Principles.*

Would you not use topical applications to the head?

872. The patient having been bled—the hair should be cut off as close to the scalp as possible, to admit of cold applications to the head—such as pounded ice or snow; or, should neither of these be at hand, napkins wrung out in cold water, vinegar and water, or the freezing mixture may be substituted.—*See* 422.

You have said, there is another species of the puerperal convulsion, arising from irritability or weakness—How would you distinguish this kind from that resulting from plethora?

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* I think, with Mr. Burns, that it is not essential, at least in the first place, to take blood from the jugular vein, and that it will generally be sufficient to take it from one of the brachial veins, for the reasons stated at page 106. But if, after a considerable quantity of blood has been taken from this source, the convulsive action should not be subdued, I would go to the external jugular vein; in doing which, there is neither *difficulty nor hazard;* and it must be confessed, that in affections of the head, the external jugular veins appear to be a very natural outlet.

I remember an instance of the plethoric puerperal convulsion, in which the fits were not arrested by repeated bleedings from the arm, but yielded to the abstraction of blood from the external jugular. In very *plethoric* habits, would not the opening of both external jugulars at the same time be the most effectual practice?

The following case will prove the excellent effect of depletion in this formidable disease. A lady being seized with puerperal convulsions after a very tedious labour, I bled her very largely from the arm, and although this remedy was frequently repeated, the fits continued. At length her friends, fearing she would be bled to death, begged me to desist from any farther depletion, and to let her die from the disease; a result, which appeared at least very probable. To this request, however, I turned a deaf ear, and bled her again. Soon after this, her senses returned, the fits ceased, and she recovered.

873. The convulsion from this cause "makes its attack without much warning, and generally alternates with deliquium or great feeling of depression and debility: the muscles about the face and chest are chiefly affected, and the pulse is small, compressible, and frequent; the face pale; the eyes sunk, and the extremities cold. The fits succeed each other pretty quickly, and very soon terminate in a fatal syncope."—*Ibid.*

What is the treatment of this species of puerperal convulsion?

874. "This species naturally requires that we should, first of all, check the farther operation of the exciting cause, by restraining hemorrhage, or preventing every kind of exertion, and then husband the strength that remains, or recruit it by cordials. Opiates are of great service."*—*Ibid.*

What would be your treatment with regard to the utero-gestation under circumstances of puerperal convulsion?

875. Such means having been premised, as the nature of the case more immediately demanded—such as depletion in the

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* Doctor Clarke divided the puerperal convulsion into the plethoric and irritable—and held, that the latter was excited by causes, acting on the nervous system in irritable habits—such as children born under clandestine circumstances, sudden alarms, &c., and that the fit was usually preceded by a violent lancing pain at the region of the stomach, resembling the piercing of a sword. He recommended this kind of convulsion to be treated first by blood-letting from the jugular vein, and subsequently by a decided dose of opium—and was of opinion, that it would not admit of the large and unlimited depletions, advised in the plethoric case.

This affection arises from causes, certainly very different from those, that occasion the convulsion of positive exhaustion, and consequently may be termed a third species of puerperal fit, standing between that, caused by plethora, and that by excessive hemorrhage. It must, however, be granted that the diagnosis between the two former will sometimes be difficult: but if so, the practitioner will take care to let his treatment be conformable to the peculiar circumstances of the case before him. It will be seen by the following passage that Mr. Burns, although he has not described a convulsion as distinctly arising from such a cause, expresses his opinion pretty much to that effect—"Convulsions of the kind (the plethoric) I am considering evidently are connected with gestation or parturition: they occur at no other time, and are more frequent in the first labour. They arise particularly from uterine irritation, but also seem frequently to be connected with a neglected state of the bowels—a fact to which I wish to call the attention of practitioners. It is a general opinion that pregnancy produces plethora, and I do not mean here to dispute the fact, but distinctly to assert that *we often confound the effects of excitement with those of fulness;* for in many instances a powerful stimulus will produce the same consequences in a spare and bloodless habit, that a smaller one would have done in a plethoric habit."—*Principles of Midwifery.*

plethoric, and opium in the irritable convulsion, the delivery should be effected cautiously and without delay.

But should the os uteri be perfectly closed, would you nevertheless deliver?

876. Decidedly not—but "the os uteri is generally open to a certain degree; and the detraction of blood, which has been resorted to on the first attack of the disease, renders the os uteri usually lax and dilatable. In this case, although we have no distinct labour pains, we must introduce the hand, and slowly dilate it, and deliver the child."--*Ibid.*

If the convulsions continue after the delivery of the child, and the placenta be retained, would you proceed to take it away?

877. The same reasons that induced me to deliver the child would prompt me to remove the placenta also.

Are there any medicines, that can be relied upon to assist the plan above recommended for the treatment of plethoric convulsion?

878. "Internal remedies have been advised, such as opium, and musk and camphor; but experience does not establish the utility of the two last, and the first is highly dangerous, tending to convert the disease into fatal apoplexy. If in any case it is admissible, copious venesection must precede it, and the bowels must have been opened."—*Ibid.* The ergot of rye has been recommended to induce labour, and the extract of belladonna locally applied to the os uteri to dilate it; but none of these means can be relied on. Blood-letting is the chief remedy; and Mr. Burns so much insists on its superiority over all other means, as to say, "it may be the only means of saving life; and if this book serve only to impress that point on the mind of one reader, I will not regret having written it."

But might not urgent circumstances sometimes demand the immediate adhibition of laudanum?

879. After full bleeding, should there be violent pain of the stomach (a symptom which sometimes takes place), or should there be great nervous irritation, without *much* determination to the head, an opiate may be indispensable; but we must assure ourselves of this, before we administer it.

Should the convulsions continue after the above means have been adopted and the delivery completed, what other measures have you to recommend?

880. In these circumstances we ought to give large doses of camphor, and apply a blister to the head.—*Burns' Principles.*

After the cessation of the fits, what treatment would you adopt to prevent their return?

881. Cold applications to the head; warmth to the feet; purgatives; an elevated position of the head; a low diet, and a still and dark apartment.

Is there any other convulsive action, occurring during labour, that may be confounded with the true puerperal convulsion?

882. There is an hysterical paroxysm, which sometimes, though rarely, is observed during labour, and which may occasion alarm, under the idea that it is a puerperal convulsion; but by recalling to our minds the symptoms of hysteria, we shall speedily be convinced of its true nature.

GENUS 7.—*Apoplexia.* Apoplexy.

Might not apoplexy sometimes occur as the result of uterogestation?

883. It might; but such a result is of rare occurrence.

What would be your treatment of the disease under such circumstances?

884. The chief resource, as at other times, is the lancet. "The child claims our attention in this disease. If it occur during labour, and death be evidently approaching, the delivery ought to be promoted as soon as possible, by turning or the forceps, in order to preserve the child. If it occur in the end of pregnancy, the Cæsarean operation should be performed immediately after death; or, with a better chance, before it; for the mother cannot suffer in such circumstances, being moribund."—*Burns' Principles.*

GENUS 8.—*Hæmorrhagia.* Hemorrhage in the three last months of pregnancy.

SPECIES 1.—*Hæmorrhagia ante partum.* Hemorrhage before birth.

What is the immediate cause of uterine hemorrhage before the birth of the child?

885. The separation of part of the placenta from its uterine attachment.

What are the principal exciting causes of such a separation?

886. Sudden exertion, fright, accident, and the accession of labour.

Under what circumstances is the accession of labour productive of hemorrhage?

887. When the placenta is attached over the os uteri.

Is hemorrhage from these causes, and at this period, dangerous to the patient?

888. Hemorrhage from the three first-mentioned causes will be dangerous or not according to its degree; but hemorrhage from the placenta being attached over the os uteri, must always be accounted replete of hazard; as it must of consequence in the progress of the labour become profuse, and, if not remedied, most probably fatal to the patient.

What are the symptoms which indicate danger from such hemorrhage?

889. "The danger arising from hemorrhage is indicated by the weakness or quickness of the pulse, or by its becoming imperceptible; by the paleness of the lips, and a ghastly countenance; by inquietude; by continued fainting; by a high and laborious respiration, and by convulsions."*—*Denman's Aphorisms.*

"Near the full period of utero-gestation, women are always in greater danger in those hemorrhages, which are not accompanied with pain; for the pain proving the contraction of the uterus, and thus proving that the strength of the constitution is not exhausted, the danger in hemorrhage may often be estimated by the absence or presence of pain."—*Ibid.*

Now, supposing you were called to a patient who had lost a little blood (exempli gratiâ, four ounces) at any time during the three last months of utero-gestation, what would be your conduct?

890. I should immediately examine per vaginam, and should I find that the placenta was not situated over the os uteri, I should do nothing more than confine the patient to the horizontal position, enjoin absolute rest, and adopt a refrigerant mode of treatment, both with regard to clothing, medicine, and diet.

If the hemorrhage be not checked by this plan, and become so profuse as to make an impression upon the constitution, what other measures have you to propose?

891. Should the above plan fail to check the hemorrhage, and such a flooding ensue; or should such a circumstance have

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* Some have considered vomiting a dangerous symptom; but in my practice, I have usually found it followed bybeneficial results, provided the cause of the hemorrhage has been removed.

occurred before my first visit, I consider that safety could alone be found in immediate delivery.

But are not other means recommended, that would effectually check the hemorrhage, and thus render such a severe measure as delivery unnecessary?

892. Some have laid great stress upon the use of the plug until the os uteri become sufficiently dilatable; whilst others have recommended the rupturing of the membranes to contract the uterus; but on neither of these can absolute dependance be placed: when, therefore, the flooding is or has been so profuse as to endanger the life of the patient, we ought not to temporize, but cautiously to deliver.

Would you deliver whilst the os uteri is firm and unyielding?

893. Such a state of the os uteri is not likely to be found under the effect of profuse hemorrhage. That it is more or less open, the escape of the flooding positively proves: and this being the case, there will be comparatively far greater risk from the return of the hemorrhage than from the cautious introduction of the hand into the uterus, the rupturing of the membranes, and the slow delivery of the child; we ought therefore to be guided alone by the nature of the flooding and its effects on the system.

But is there not great danger in forcibly introducing the hand into the uterus, on the first spring of the hemorrhage?

894. If the placenta *be not* attached over the os uteri (which is the case we are now supposing), and if the hemorrhage be not profuse, such an operation is unjustifiable; if it be profuse, and productive of syncope, the delivery ought to be effected not by a *forcible*, but by a cautious and deliberate dilatation of the os uteri—such a dilatation would be attended with but little pain and no danger whatever to the patient.

"*There still remains an important question to be answered:—In those cases, where the patient has been allowed to lose a great deal of blood frequently and suddenly; when the strength is gone; the pulse scarcely to be felt; the extremities cold; the lips and tongue without blood, and the eye ghastly—shall we venture to deliver the woman? Shall we by plugging endeavour to prevent further loss, and by nourishment and care recruit the strength; or empty the uterus, and then endeavour to restore the loss?*

895. "We have only a choice of two dangers. The situation of the patient is most perilous, and I have in practice weighed the argument with that attention, which the awful circumstances of the case required. I think myself justified in saying, that we give both mother and child the best

chance of surviving by a cautious delivery."*—*Burns' Principles.*

Before we commence the operation, we ought to give the patient a full dose of laudanum.

Var. 1.—*Hæmorrhagia a malâ positione placentæ.* Hemorrhage from the attachment of the placenta over the os uteri.

Should you have ascertained that the flooding sprang from the placenta being situated over the os uteri, what treatment would you adopt?

896. We are called upon to "free the patient from the imminent danger she is in, by artificial delivery. Of the propriety of this delivery, there is no doubt, or can be any dispute, except as to the precise time when the patient ought to be delivered."—*Denman's Aphorisms.*

Would you deliver in this case as soon as the hemorrhage takes place?

897. "On the first appearance of the hemorrhage, unless it be prodigious in quantity, or unusually terrifying in its effect, it is seldom either requisite or proper to attempt to deliver by art; but as a patient with this circumstance cannot be secure till she is delivered, and as the delivery is seldom completed

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* The results of my own practice in this most important case enable me to support Mr. Burns in this opinion.

The reader will find two valuable cases on this point of practice in the Medico-Chirurgical Transactions, related by Mr. Stewart, Lecturer in Midwifery, vol. iv., page 358. He strongly advises the adhibition of opium previously to the attempt to extract the child, and lays down the following practical instructions for its use:—

"First. Opium ought not to be exhibited, till we have determined that the natural efforts are insufficient to expel the child.

"Secondly. When we have determined upon delivering the patient by turning the child, a large opiate, not less than eighty drops of the tincture, or four grains of solid opium, ought always to be given: and, if the circumstances of the case will permit, we should wait twenty minutes, if the tincture, or half an hour, if the solid opium is given, before the hand is introduced.

"Thirdly. As often as symptoms of general irritability or great debility supervene, the opiate ought to be repeated, and the dose increased according to the urgency of the symptoms.

"Fourthly. If the general system has suffered severely from the effects of the hemorrhage, the opiate must not be diminished in quantity, or suddenly remitted, although symptoms of irritability be not present."

by the natural efforts; and as the artificial delivery, though performed before it is absolutely necessary, is not dangerous if performed with care, we must be on our guard not to delay the delivery too long."—*Ibid.*

Would you feel justified in leaving a patient, after that she had flooded from this cause?

898. Not to any considerable distance, as immediate delivery may be required on the recurrence of the hemorrhage.

Should the uterus be very little dilated, and oppose considerable resistance to the introduction of the hand, would you nevertheless persist in accomplishing the delivery?

899. In a perilous labour from the presentation of the placenta, the state of the os uteri is not to be taken into the account so much as the degree and effect of the hemorrhage. Whilst the young practitioner is waiting for its flaccidity or dilatation, the flooding may return, and the woman be lost; for though "in some cases, in which it may be thought eligible to deliver on account of the hemorrhage, the parts are so unyielding as not to allow of the operation itself without some hazard, yet when the parts requiring dilatation make no resistance to the passage of the hand, the event of the operation is always more precarious, the operation having been deferred too long."*—*Denman's Aphorisms.*

Suppose you are not called till the patient has had one or two attacks and has been reduced to great danger, and you find her with feeble pulse, ghastly countenance, frequent vomiting, and complaining occasionally of slight pains—under such circumstances how would you act?

900. "We cannot here hesitate a moment what course to follow—if the patient is to be saved, it is by delivery."

Describe the operation of delivering in presentations of the placenta.

901. This will depend on the precise situation of the placenta with regard to the os uteri. If the centre of the placenta should not be situated immediately over it, and we should be enabled to feel its edge, we pass by the placenta to the membranes; but if the centre of the placenta present, "it is of little consequence whether we perforate the placenta with our fingers, or separate it on one side till we come to the

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* "Another mark of danger is a relaxed state of the os uteri. If the os uteri forms an obstruction, and acts strongly on your fingers, the danger is far less than when it can be easily relaxed."—*Manuscript of Doctor Clarke's Lectures.*

edge, though the latter is generally preferable."—*Denman's Aphorisms.*—Whichever course is taken, the membranes are to be ruptured and the child delivered by the feet.

Would you deliver the child immediately; or, having brought the feet down, wait for the pains?

902. I should wait a reasonable time for the pains, that I may be assured of a disposition on the part of the uterus to contract; and to this there will be no objection, as the hemorrhage will be checked by the pressure of the thighs or trunk of the child.

SPECIES 2.—*Hæmorrhagia inter partum infantis et placentæ.* Hemorrhage after the birth of the child, and before the expulsion of the placenta.

What are the principal causes of uterine hemorrhage at this period?

903. A partial separation and retention of the placenta, in consequence of an insufficient or irregular action of the uterus.

May not the placenta be retained from any other cause?

904. Yes—by organic adhesion to the uterus.

If, after the birth of the child, hemorrhage should take place, and there be at the same time no disposition on the part of the uterus to expel the placenta, would you pull the funis with any degree of force, in the hope of producing that effect?

905. It would be justifiable and prudent to keep the funis upon the stretch, to ascertain if the placenta be wholly detached; and if not, to excite the uterus to contract and expel it; but nothing would be more reprehensible on the part of the accoucheur, or more dangerous to the patient, *than to pull the cord with any degree of force.*

What are the dangers, that may be occasioned by such a practice?

906. If the funis be weak, it will probably be broken off, and this important guide will be thus lost, in case we may be called upon to extract the placenta by a manual operation; or, if it be strong, what is still worse, the uterus may be inverted.

At the commencement of hemorrhage from this cause, would you at once attempt the extraction of the placenta?

907. We ought not yet to attempt the extraction of the placenta, but rather to endeavour still to excite the uterus to action, in order that it may expel the placenta. "Friction

is of evident advantage in exciting the uterus. It is effected by placing the hand firmly on the abdominal parietes and moving these briskly, but not rudely, over the uterus, and occasionally grasping that viscus gently."—*Burns' Principles.*

At the same time we may administer some gentle stimulus internally—such as a tea-spoonful of sal volatile, or a table-spoonful of brandy in gruel.

If, however, the hemorrhage should continue, and the placenta not descend, what are the next means you would employ?

908. We should immediately introduce the hand, having first smeared it and the fore-arm with lard, into the vagina, and taking the cord for our guide, pass onward to the placenta. "We do not attempt to bring it away, but press upon it with the back of the hand, to excite the uterus to separate it; or if it be already detached, and lying loose in the cavity of the womb, we move the hand gently, to stimulate the uterus, but do not withdraw it, nor extract the placenta, until we have, by gentle motion or pressure, excited the uterus, and feel it contracting; or until we are satisfied that the pressure of the hand is not effecting this purpose.* In this case we ought to remove both the hand and the placenta at once; and several coagula are often expelled along with these, the uterus contracting so as to put an immediate end to all further anxiety."†—*Burns' Principles.*

Should you have occasion to separate the placenta from the uterus, in what manner would you accomplish it?

909. Either by turning it backwards on itself, or by rubbing its attachment from the uterus by the soft part of the fingers.

Might not the internal administration of the ergot of rye be efficient in producing contraction of the uterus and the expulsion of the placenta, and thus prevent the necessity of the manual operation? ‡

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* Doctor Clarke advised that, before we proceeded to separate the placenta, we should make a feint of withdrawing the hand from the uterus, which is frequently followed by uterine contraction and the expulsion of the secundines.—*Manuscript of his Lectures.*

† Whenever I have been under the necessity of extracting the placenta, I have never found the hemorrhage return.

‡ No remedy, perhaps, has been more variously reported than the ergot of rye, with reference to its action on the uterus. Some extol it as a remedy likely to supersede the pains and perils of child-birth; whilst others assert that it is a medicine of little or no efficacy. Several physicians also say, that if given during parturition, it will prove a prophylactic and prevent flooding after delivery. Amongst these are Dewees, Stearns, and

910. This remedy may be contemplated in a case of retention without hemorrhage: but when the retention is accompanied by profuse hemorrhage, we should not be justified in waiting for the action of an uncertain remedy, but ought immediately to stop the hemorrhage by the removal of the placenta in the manner above described.

In cases of retained placenta, accompanied by hemorrhage, is not the uterus sometimes found irregularly contracted?

911. This is not an unfrequent occurrence, and that most commonly met with is the hour-glass form, in which the uterus is contracted in the centre by the partial action of its transverse muscular fibres.

Have you the power of ascertaining this state of the uterus previously to the introduction of the hand into its cavity?

912. It may be generally detected by an examination of the size and shape of the uterus through the abdominal parietes, and it may be also presumed by certain accompanying symptoms.

What are they?

913. "Pain in the back, sometimes severe, great depression of strength, and a very feeble pulse, sickness and paleness, and last of all, uterine hemorrhage, which occurs early, and is sometimes profuse."—*Burns' Principles.*

Church, of America, and Bigeschi, of Italy. Bordot, Gonfiel, and Prefet, of France, state that it has also the power of checking hemorrhage after delivery, in illustration of which they give several cases of its success. They say that the dose should not be small, and that it may be given freely in lavements. In this country, it has been recommended by many, but more especially by Doctor Adam Neale, and by Mr. W. Mitchell. The latter says, "The more I see of the ergot in my practice, the more frequently I am induced to have recourse to it. If I arrive now, and find the labour likely to be concluded in half an hour, yet if, from previous acquaintance with my patient, I know there is a probability of flooding after, I give ergot to prevent the dangerous consequence; for if delayed until after the birth, it will have no effect on the hemorrhage."— *Treatise on the Ergot.*

On the other hand, amongst those, who declare the ergot to be of doubtful efficacy, or wholly inert, are Desormeaux, Gardièn, Philibert, Vauquelin, Le Mercier, Le Maire, Lysancourt, and others. In this country, the same thing is declared by Mr. W. A. Walford, in a very circumstantial article, recorded in the Lancet, Nov. 28, 1829.

I cannot speak of its qualities from my own practice; but I should say, that until it has undergone the test of farther experience, and its reputation has been established upon a less conflicting basis, it ought never to be depended on in so perilous a case as uterine hemorrhage, especially whilst we possess means of so much greater efficacy.

What would be your treatment in this case?

914. "We are immediately to give a full dose of laudanum; we must also, without loss of time, introduce the hand into the uterus, and slowly and cautiously dilate the stricture, so as to get the hand into the upper cyst of the uterus, thus stimulating it to universal and regular contraction; and in doing so, we shall be greatly assisted, should the ordinary means fail, by applying cold water to the abdomen, or dashing water smartly upon it with a cloth."—*Ibid.*

But should these measures fail to bring on regular action, the placenta being retained, would you not immediately detach the placenta?

915. "If the placenta be still retained, it is to be slowly detached, and, after keeping it and the hand for some time in the under part of the womb, both may be withdrawn."*—*Ibid.*

Should you discover that the placenta is retained, not by an irregular action of the uterus, but by organic adhesion, what would be your management of the placenta?

916. Following the navel-string as our guide, we should pass the hand to the placenta, and separate it in the most deliberate manner.

But, suppose a portion of the placenta should adhere so firmly as to make it unsafe to separate it with the fingers?

917. "Should this circumstance occur, notwithstanding the most deliberate and firm proceeding, it may sometimes be more justifiable to leave the adhering part remaining, than to use violence in separating it; but, though the hemorrhage be stayed when the greater portion of the placenta is brought away, it is always a desirable thing to bring away the placenta and membranes in a perfect state."—*Denman's Aphorisms.*

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* In cases of retained placenta from the hour-glass contraction of the uterus, we ought *never* to put the funis upon the stretch, even with the view to solicit only the action of the uterus, as it cannot produce such an effect; for should the funis be broken in the attempt (and such a circumstance will sometimes occur, from the instability of its texture, even to the most cautious practitioner) we shall at once be reduced to the unpleasant necessity of being obliged to separate the placenta without a guide, in the midst of coagula and membranes, and in an irregularly contracted uterus—a situation, in my opinion, of no small difficulty to ourselves, and great hazard to the patient.

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Species 3.—*Hæmorrhagia post partum placentæ.* Hemorrhage after the expulsion or extraction of the placenta.

Should hemorrhage occur to an alarming degree, after the expulsion or extraction of the placenta, what are the best means of checking it?

918. In this case, opiates will be found of the greatest service.* "They are among the safest and best cordials we can employ, and must, in every instance, be exhibited. The dose ought to be proportioned to the urgency, varying from fifty to sixty drops. In some instances, when the debility was great, a hundred drops of the tincture, or, when the stomach was very irritable, five grains of solid opium have been given at once, and afterwards, three grains every three hours, till the patient was out of danger. But I do not consider such large

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* Some years ago, I felt a strong prejudice against the internal administration of opium in uterine hemorrhage, considering that, as it was effectual in removing spasmodic action of the bladder, it would also prevent the muscular contraction of the uterus. Impressed with this idea, I continued to employ the mode of treatment recommended by Doctor Clarke; and, in justice to him, I must say, that I was always fortunate enough to restore my patient, till I met with the following case, which made me a convert to the system of giving opiates as a remedy for uterine hemorrhage.

Mrs. D——, ætat. about 35, of fair complexion, delicate constitution, and quite decrepit from a weakness of the lower extremities, fell into labour at the natural period, with her sixth child; and, after a lingering time, was delivered by her own efforts. After the usual interval, the placenta was expelled, and, what had never before occurred to her, was followed by profuse hemorrhage. I immediately lessened the bed-clothes, cooled the apartment, applied cold to the external parts of generation, loins and abdomen, and at the same time, gave her strong doses of the volatile alkali, in cold milk and gruel. This treatment was continued for some time, but I found that it utterly failed; the hemorrhage continued, and the fainting became very alarming, especially in so weak and worn-out a constitution. I trembled for the result; and as all other means had been unavailing, I immediately gave her two grains of opium, and repeated half the dose in a quarter of an hour. Very soon afterwards, the pulse became firm and strong, the flooding subsided, and she recovered.

This case was so conclusive in favour of opium, that I have ever given it in similar necessitous emergencies, and found it a most valuable remedy.

It is difficult to explain the modus operandi of opium, as a remedy for the restraining of uterine hemorrhage, but certain it is, that it imparts an increased action to the arterial system, indicated by a strong round pulse; and it is probable that, under its invigorating influence, the uterus gradually contracts.

doses of laudanum to be necessary, and as for the solid opium, it ought to be given in doses only of a grain, to allay the irritability of the stomach after the pressing danger is past."—*Burns' Principles.*

What other means would you employ?

919. The apartment should be cooled; the bed-clothes reduced to a single sheet; a bandage should be firmly carried around the abdomen; and napkins, wrung out in cold vinegar and water, should be applied to the external parts of generation, the sacrum and pubes. We ought at the same time to support the woman with cold milk and gruel, mixed with a stimulating dose of the aromatic spirit of ammonia, and to take every pillow from under her head.

Would you not, in this case, prefer the administration of the ergot of rye to that of the opium?

920. In such a case, the ergot is clearly indicated, and in minor degrees of hemorrhage may be tried previously to the opium; but in hemorrhages at once dangerous to life, the opium should ever be preferred as a remedy of more certain efficacy.

Should the above mode of treatment fail to arrest the hemorrhage, what have you next to propose?

921. In such an emergency, we ought to stimulate the cavity of the uterus by the introduction of the hand; and we shall be fully justified in carrying up ice or snow (if it can be procured) with the same view.*

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* I have restrained a frightful hemorrhage of this kind, in a lady delivered of her first child, by covering the abdomen with a large piece of ice.

The late Doctor Gooch, speaking of the use of the plug in these cases, says, "I had been talking on the subject with Doctor Rigby, at Norwich, who told me that in hemorrhage from the uterus after delivery, he had found Le Roux's remedy the most effectual, and that it had unquestionably enabled him to save several lives, which must otherwise inevitably have been lost. I took several handkerchiefs, soaked them in vinegar, and passed them one after the other into the vagina, so as completely to fill it; this effectually prevented all external hemorrhage; I no longer felt the blood pouring over my hand; the uterus began to harden; my patient complained of pain; the colour came into her face again, and her faintness, she said, was gone. The favourable appearances, however, lasted but a short time; the pains ceased; the uterus grew soft, and seemed to swell; the pulse became thread-like and weak; and she turned ghastly pale. It was plain that, though I had prevented the blood from escaping externally, it was flowing into the uterus in great quantity, and that I had only converted an external into an internal hemorrhage."

But should the patient continue to sink, notwithstanding the application of all these means, and life be fast ebbing, have you left any other resource?

922. Yes; the operation of transfusion should be adopted instantly.

But could this process be carried into execution without an apparatus fit for the purpose?

923. The operation is very simple, and may be performed with a syringe purposely made, and a glass with a small bottom, in the following manner—as recommended by Dr. Blundell:

1st. Having warmed the instruments to be used by immersion in hot water, they are to be intrusted to an assistant, who is to wash out the syringe after every injection, in order to keep it clear from coagula, &c.

2dly. An incision is to be made about an inch in length, over the median bazilic, or any other contiguous vein, which may appear better fitted for the operation. Having laid bare the vessel, it is to be raised over a needle in order to isolate it from the surrounding parts. A small incision is then to be made into the vein, large enough to admit the nozzle of the syringe.

3dly. A vein is next to be opened in the arm of the person about to give a portion of blood, which is to be received into a glass with a small bottom; and about an ounce having been allowed to flow, the nozzle of the syringe is to be immersed in it, taking care to keep the point some depth below the surface to prevent the admittance of air. The piston is now to be gently raised and the syringe filled, containing about two ounces.

4thly. This being done, we may proceed to introduce the nozzle of the syringe into the orifice previously made in the

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"My belief now is, that when hemorrhage occurs after the removal of the placenta, the quickest way to stop it, is to introduce the left hand closed within the uterus, apply the right hand open to the outside of the abdomen, and then, between the two, to compress the part, where the placenta was attached, and from which chiefly the blood is flowing." "It is true, we cannot tell with certainty, where the placenta was attached, and consequently, where the pressure should be applied; but, as it is generally attached to or near the fundus, if the pressure be directed there, it will generally be right." He then goes on to state, that he removed the plugging, applied his hands in the manner just described, and effectually stopped the hemorrhage. This is a most valuable paper on uterine hemorrhage, and well worth the perusal of every accoucheur—it will be found in the Med. Chir. Trans. vol. xii. p. 152.

vein of the patient, directing its apex towards the heart; but we must take care to keep the point elevated in its way from the glass, at the same time pushing up the piston till the blood is seen, in order to exclude any bubble of air, which the syringe may have received. Then, closing the nozzle with the finger till it reaches the vein, the injection may commence, and be made to imitate an ordinary, though somewhat hurried, circulation.

In this way the process is to be repeated till a sufficient quantity of blood has been injected into the system of the recipient.

What quantity of blood would you consider sufficient for an adult at any one transfusion?

924. Mr. Green, in the case of Samuel Tockning (Lancet, Dec. 12, 1829), injected first ℥viij, and afterwards ℥x, without any ill effect from the quantity. Dr. Blundell says, "sixteen ounces of blood, for the female system, is a large aggregate quantity; eight or ten are more sparing; four or five may, in delicate cases, turn the scale in our favour."—*Blundell's Lectures in the Lancet.*

Do you not consider it important that the blood for the purpose of transfusion should be taken from a person of the same sex and age?

925. I should certainly prefer taking blood from a person as nearly as possible of the same sex and age; but Dr. Blundell is of the opinion that it is sufficient to transfuse from the same genus of animals.—*Ibid.*

If from either of the above methods the patient should be happily placed in a state of comparative safety, what treatment would you adopt to maintain the advantages, that have been gained and further improve the patient?

926. With this view we ought to give small portions of nutriment frequently, and the best kind will be milk and gruel. When all disposition to faint has ceased, the patient should be encouraged to sleep—a remedy which will generally place her beyond the perils of hemorrhage.

Moreover, every practitioner ought to sit by the bed-side of his patient, not only till the hemorrhage has ceased, but until, by nourishment and refreshing sleep, her countenance, pulse, and manner assure him that the danger is past; and when he shall feel justified in leaving her, he ought to impress upon the minds of her friends that she must not be raised from the horizontal position till his return. He may, however, allow her to be drawn, by means of the sheet beneath, to the other side of the bed, after the lapse of six or eight hours, and be refreshed with clean linen, &c.*

Genus 9.—*Inversio uteri.* Inversion of the uterus.

What is signified by an inversion of the uterus?

927. An inversion of the uterus is signified, when the fundus is so drawn downwards as to pass through the os uteri, and to present in the form of a tumour at the external parts.

At what time does inversion usually occur, and from what cause?

928. It never occurs but after parturition, and is most commonly occasioned by midwives pulling violently at the funis. It may also be produced by the natural pains in the act of expelling a child attached to the placenta by a very short funis; and sometimes, though very rarely, by the partial action of the longitudinal fibres.

Does inversion always take place to the same degree?

929. No; the inversion may be either complete or incomplete. Complete, when the organ is turned literally inside out, with the fundus below, and the cervix and os uteri above; incomplete, when the fundus is either simply depressed or indented, in which case it can be felt within the os uteri, or when it has in part passed the orifice.

What are the local and constitutional symptoms of inversion?

930. "When the uterus is inverted, the patient feels great pain, generally accompanied with a bearing-down effort, by which a partial inversion is sometimes rendered complete. The pain is obstinate and severe; she feels very weak; the countenance is pale; the pulse feeble, perhaps nearly imperceptible; hemorrhage very generally attends the accident, and often is most profuse. But it is worthy of notice, that frequently complete inversion is not accompanied with hemor-

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* It was customary with me, both before and after the expulsion of the placenta, to clear away all coagula that may have escaped, and to spread a napkin beneath the patient, renewing it as often as circumstances required. By which means I was enabled to ascertain with tolerable accuracy the quantity of blood that was lost.

Although not arising strictly from puerperal causes, I shall here briefly state that profuse and dangerous hemorrhages sometimes are derived from the formation of large clusters of uterine hydatids, and sometimes from carcinomatous ulceration of the os uteri. In the former case, the hydatids ought to be carefully extracted; in the latter, the best remedies will be found in large doses of opium, and in astringent or turpentine injections.

rhage, whilst a very partial inversion may be attended with a fatal discharge. Although there be little hemorrhage, the face is pale and the pulse weak and rapid. A sensation of dragging at the stomach, or a feeling, as if the bowels were pulled out of the belly, may accompany inversion. Fainting and convulsions are not unfrequent attendants, although the hemorrhage have been trifling."—*Burns' Principles.*

Suspecting from these symptoms the presence of inversion of the uterus, by what method would you confirm your suspicions?

931. By an examination of the abdomen and vagina; if the uterus could not be felt through the abdomen, and if a globular, hard, fleshy mass should be felt in the vagina, inversion would be decidedly proved.

What ought to be the immediate treatment of such an emergency?

932. If inversion be discovered early, the uterus may be replaced; if it have protruded out of the vagina, it is first of all to be returned within it; if it have not, we proceed directly to endeavour to return it within the os uteri, by cautiously grasping the tumour in the hand, and pushing it upwards within the os uteri. This may be facilitated by pressing up the most prominent part of the fundus in the direction of the axis of the uterus, so as gradually to undo the inversion, or re-invert the protruded womb: a piece of wood, with a round head, has by some been used in this way, but the fingers are safer.

"If we push directly, without compressing the tumour, we sometimes bring on violent bearing-down pains. These are occasionally attended with increase or renewal of flooding; and in all cases, on pressing the uterus, small vessels spout like arteries in an operation. If we succeed, we should carry the hand within the uterus, and keep it there for some time to excite its contraction."—*Burns' Principles.*

Should the placenta be adhering to the uterus, would you separate it previously or subsequently to the reduction of the inversion?

933. "If the placenta be partly separated, it will be proper to finish the separation before we attempt to replace the uterus; but if the placenta should wholly adhere, it will be better to replace the uterus before we endeavour to separate the placenta."—*Denman's Introduction.*

Mr. Burns, on the contrary, says, "If the placenta still adhere, we should not remove it until we have reduced the uterus; after which, we excite the contraction of the womb to make it throw it off."—*Burns' Principles.*

Is it not difficult to reduce an inverted uterus, if the attempt has been delayed even a little while?

934. If inversion have not been discovered early, it is more difficult, nay sometimes impossible to reduce it, owing chiefly to the contraction of the os uteri. Dr. Denman says, that he has found it impossible to reduce it, even four hours after it took place; and in a chronic inversion he never once succeeded.

Should you be called too late to effect the reduction of the uterine inversion with your most earnest endeavours and best efforts, what treatment would you adopt?

935. "In such cases it is not prudent to make any violent efforts to reduce the uterus, as these may excite convulsions, &c. Soon after becoming inverted, the uterus is apt to swell and inflame. If this have happened, no attempt should be made to reduce, till by bleeding and rest and mild fomentations that state have been allayed. We must in every instance alleviate urgent symptoms, such as syncope, retention of urine, or inflammation, by suitable means."—*Burns' Principles.*

But if, upon another reasonable attempt at reduction, after those means have been employed, your efforts should be unavailing, what palliative treatment would you adopt?

936. "When the uterus cannot be replaced, we should at least return it into the vagina. We must palliate symptoms, apply gentle astringent lotions, keep the patient easy and quiet, attend to the state of the bladder, support the strength, allay irritation by anodynes, and the troublesome bearing down by a proper pessary. A spring bandage is also useful. If inflammation come on, as is usually the case, we must prescribe blood-letting, laxatives, &c."—*Ibid.*

Should the patient's life be endangered by repeated hemorrhages flowing from the inverted uterus, have you any means left, which you would be justified in using, to save her from death?

937. "If the woman were evidently in danger of sinking from the oozings, extirpation, with proper caution and by competent hands, may be thought of."—*Blundell's Lectures.*—But surely, at this period, such an operation ought never to be decided on till all other means had failed to restrain the hemorrhage, and till the life of the patient were brought into the most imminent danger by the effects of the inversion.*

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* Dr. Blundell, in the same lecture, says, that "Mr. Webber, an active-minded practitioner, of Yarmouth, successfully extirpated the inverted

GENUS 10.—*Laceratio perinæi.* Laceration of the perinæum.

What is the cause of perineal laceration in cases of parturition?

938. The pressure of the presentation during its passage through the axis of the vagina.

Can this injury be prevented by the accoucheur?

939. Yes; such a laceration, in a great majority of cases, if not in all, can be prevented by supporting the perinæum with

uterus on the fourteenth or fifteenth day of delivery. Dr. Hull also relates a case, taken from Wrisberg, in which the inverted uterus was cut away by an ignorant midwife immediately after the inversion, and with a successful result. But in every case of this kind it will be undoubtedly right to wait (if the urgency of the symptoms should not forbid it) till the bulk of the uterus is reduced to its minimum, in order that the ligature may have the less to divide, and that there may be no hazard of involving any portion of the abdominal viscera.

Such has been the success of removing the inverted uterus in a *chronic* state, that, in my opinion, the operation ought generally to be performed, in order to save the patient from that exhaustion and death which assuredly await her. Mr. W. Newnham, in a valuable essay on this subject, has cited almost every operation of this kind that has been performed on the continent and in this country; and it appears that Dr. Clarke, of London, was the first to hazard the result of this mode of treatment in England. Dr. Clarke's operation was performed subsequently to the period of menstruation with complete success; but he says, "How far it may be right to resort to this operation during the menstruating part of a woman's life the author has no means of judging." *Observations on those Diseases of Females, &c.*—Mr. Newnham's case may be considered the first in this country to settle this question, and to crown the operation with the same success during the menstruating period of female life. Subsequently to this two other cases have been put on record; one of which occurred to Mr. Windsor, of Manchester, and is related in the tenth vol. of the Medico-Chirurgical Transactions, p. 349; the other was successfully removed by Dr. Clarke, in consultation with Dr. Granville, the late Dr. Gooch, and Dr. Henry Davies, and is recorded in Gooch's work on Diseases of Women. In a conversation which I lately held with Dr. Blundell on this subject, he was good enough to inform me that he had likewise successfully removed a chronic inversion of the uterus within the menstruating period of life. Dr. Blundell used a wire ligature, which, during the first day, occasioned *most severe* pain and vomiting. These distressing effects were, however, soon controlled by adequate doses of laudanum; after which, the severity of the pain subsided, and the inverted portion of the uterus became separated on *the twelfth* day.

Shortly after the successful termination of Mr Newnham's case, which I occasionally visited during the application of the ligature at his request, I met with another instance of chronic inversion of the uterus in a young married woman, who lived in Oxfordshire, at a considerable distance from me. The shape of the inverted portion of the uterus in this case differed materially from that of Mr. Newnham's. In the latter, the inversion protruded into the vagina, in the form of a cylinder, the flat of the hand; and, therefore, it is a duty incumbent on every practitioner to be most attentive in this respect.

Through what parts does such a laceration usually extend?

940. In the generality of cases it does not extend beyond the perinæum; but in some instances the sphincter ani and the rectum are torn asunder.

What is the treatment of such an injury?

941. When the wound is confined to the perinæum, little else will be necessary than a due attention to cleanliness or the use of a poultice; but when the rent extends through the rectum, the torn edges should be brought together by ligatures, and further supported by long strips of adhesive plaister. "It would appear that there is no occasion for putting a ligature in the recto-vaginal septum. It is sufficient to place two in the perinaum."—*Burns.* "Rest and retaining the thighs as much together as possible, together with frequent ablution, in order to remove the urine, which sometimes for a few days flows involuntarily, or the lochia and stools, are requisites in every mode of treatment."—*Ibid.*

the base of which could not be found through the os uteri, by an ordinary examination per vaginam; whereas, in the former, the inversion was more of a sphere, the size of which was that of a moderate apple, and its base could be readily touched by the finger in a common examination. As the patient was brought to me without the slightest expectation, either on the part of herself or her friends, of being subjected to so severe and doubtful an operation, I was unwilling to adopt it without their full concurrence. I therefore sent her home, telling her of the positive necessity of such a mode of treatment, and assuring her, that I should be most willing to put it into execution immediately on her return. As she did not return, I presumed that the proposal had not obtained their consent, and, to my great regret, not long afterwards I was informed that she fell a sacrifice to the exhausting effects of the inversion. I mention this case to show the usual termination of a chronic inversion of the uterus when left to itself, and to contrast it with the happier results of the operation for its removal.

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ERRATA.

Page 66, line 10, for *Good* read *Gooch*.
—— 91, — 6, for *sauleuus*, and line 30, for *sculenus*, read *scalenus*.
——109, — 21, for *cholic* read *colic*.
——140, — 35, for *fenule* read *female*.
——160, — 25, for *retenton* read *retention*.
——167, — 20, for *uretine* read *uterine*.
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